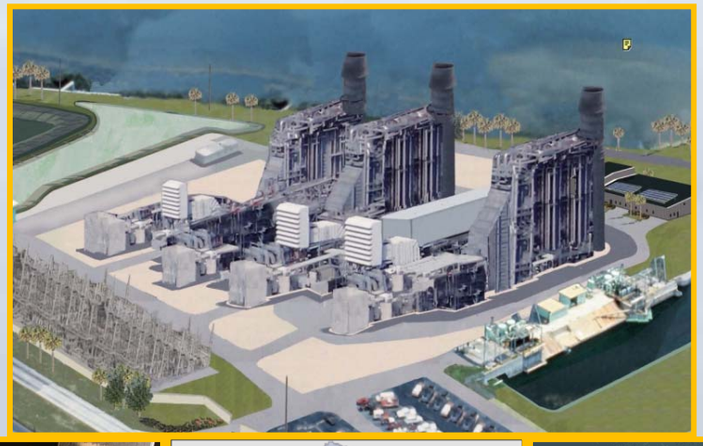
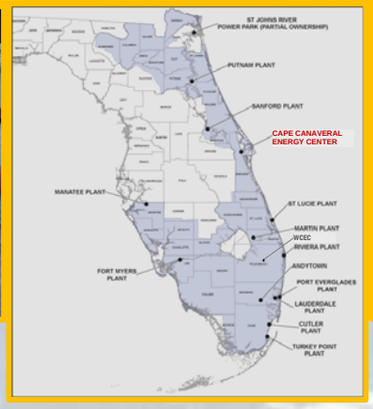
Cape Canaveral

Energy Center









Completeness Responses

March 2009

FPL

COMMENT DOCUMENTS

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: FLORIDA POWER & LIGHT COMPANY
CAPE CANAVERAL ENERGY CENTER,
Applicant.

DOAH Case No. 09-0039
DEP OGC Case No. 08-2971
PPSA No. PA08-53

/

DEPARTMENT OF ENVIRONMENTAL PROTECTION'S
DETERMINATION OF INCOMPLETENESS

Pursuant to section 403.5066, Florida Statutes (F.S.), the Florida Department of Environmental Protection (Department) hereby finds the application incomplete. A description of all completeness issues is attached and incorporated by reference herein. Pursuant to section 403.5066, F.S., as a result of the Department's declaration that the application is incomplete, the Applicant, within 15 days after the filing of this statement by the Department, is required to file with the Division of Administrative Hearings, the Department, and all parties:

(a) A withdrawal of the application; or,

(b) A statement agreeing to supply the additional information necessary to make the application complete. The additional information shall be provided within 30 days after the issuance of the Department's statement on completeness of the application. The time schedules under this act shall not be tolled if the Applicant makes the application complete within 30 days after the issuance of the Department's statement on completeness of the application. A subsequent finding by the Department that the application remains incomplete, based upon the additional information submitted by the Applicant or upon the failure of the Applicant to timely submit the additional information, tolls the time schedules under this act until the application is determined complete;

(c) A statement contesting the Department's determination of incompleteness; or

(d) A statement agreeing with the Department and requesting additional time beyond 30 days to provide the information necessary to make the application complete. If the Applicant exercises this option, the time schedules under this act are tolled until the application is determined complete.

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished **via electronic mail** only to the persons on the attached service list.

Respectfully submitted this ***9th*** day of February, 2009.

/s/ Jack Chisolm

Jack Chisolm, Deputy General Counsel
STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
3900 Commonwealth Boulevard, M.S. 35
Tallahassee, Florida 32399-3000
(850) 245-2275 / FAX 245 – 2302
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FPL CAPE CANAVERAL ENERGY CENTER
SERVICE LIST

Updated 01-06-09

-

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Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

February 9, 2009

TO: Jack Chisolm, OGC

FROM: Mike Halpin, Siting Coordination Office

Pursuant to § 403.5066, Florida Statutes, the Department of Environmental Protection (DEP) after consulting with the affected agencies has determined that the application for the site certification of Florida Power & Light (FPL) Cape Canaveral Energy Center is not complete to support a recommendation concerning certification. The following items represent requests for additional or clarifying information; Item I the Department of Environmental Protection; Item II the Department of Community Affairs; Item III the Florida Fish and Wildlife Conservation Commission; Item IV the St. Johns River Water Management District; Item V the East Central Florida Regional Planning Council; Item VI Brevard County; and Item VII the Department of State – Division of Historical Resources. The applicant should identify any items which may be more suitably handled through post-certification submittals, as well as propose related conditions of certification. Requests for completeness items related to federal permit applications are processed directly by the federally delegated or approved program and are not shown herein.

ITEM 1: DEPARTMENT OF ENVIRONMENTAL PROTECTION

A. CENTRAL DISTRICT OFFICE

a. Environmental Resource Permitting – Wetlands/Submerged Lands

i. Dredging - (Chapters 62-330, or 62-343, Florida Administrative Code)

1. Provide a spoil disposal detail, including, discharge details, locations retention plans, volumes, and data used to size the disposal cell(s). Include a description on the type of equipment that will be used to do the dredging (i.e. clamshell dredge or hydraulic dredge), and all (temporary and permanent) spoil disposal sites. Based upon the locations proposed for spoil disposal additional testing may be required. FDEP-C a.i.1

If testing is required, the following shall be provided:

(a) Sediments

Dredged sediments have the potential for elevated levels of the following elements. At certain levels these parameters can cause adverse effects to humans and wildlife.

Collect triplicate sediment samples from 4 stations within the area to be dredged (submit locations for approval prior to sampling). Please analyze two of the sediment samples for the following parameters using the specified detection limit and archive the third for analysis at the Department's request, if the results from the first two samples conflict.

Parameter	Sample	Detection Limits (mg/kg)
Aluminum	top 2 cm.	10.0
Copper	top 2 cm.	1.0
Lead	top 2 cm.	1.0
Zinc	top 2 cm.	1.0
Arsenic	top 2 cm.	1.0
Cadmium	top 2 cm.	0.05
Mercury	top 2 cm.	0.01
Polycyclic	top 2 cm.	0.5
Aromatic		
Hydrocarbons, (mg/l)		

All sediment data should be collected and analyzed using the procedures in the Deepwater Ports Maintenance Dredging and Disposal Manual, DEP, 1984.

(b) **Reporting**

All data shall be submitted with the documents containing the following information: (1) permit application number; (2) dates of sampling and analysis; (3) a statement describing the methods used in collection, handling, storage and analysis of the samples; (4) a map indicating the sampling locations; (5) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data; (6) documentation that the laboratory performing the sampling and analyses has an approved quality assurance plan on file with DEP; and (7) the MDL and PQL for each analytical method.

Monitoring reports shall also include the following information for each sample that is taken:

- time of day samples taken;
- water temperature (/C);
- salinity (ppt);
- depth of water body;

- depth of sample;
- antecedent weather conditions;
- tidal stage and direction of flow;
- wind direction and velocity;
- identification of the sample location which corresponds to the number shown on the sampling location map;
- the appropriate Rule 62-302, F.A.C., standard for the parameter being measured; and
- the detection limit for the parameter being measured.

All data shall be reported in a table (or tables) which clearly list(s) the results of parameters measured at each location, and the information described in (j) and (k), above. In addition to the above, we may find it necessary to review raw analytical data from the lab which did the analyses. The following information should be retained and readily available in case a question arises: 1) preparation logs including history of preparation, spike level, and the time the sample was spiked relative to digestion; 2) absorbencies or responses for calibration curves, analytical samples, and quality control samples; and, 3) quality control samples should include preparation blanks, calibration blanks, field blanks, and independent reference samples. Having this information readily available may eliminate the need for additional sampling.

2. Pursuant to 18-21.011(3)(a) and 18-21.011(3)(c)1., F.A.C., payment for the removal of sovereign submerged land will be required at $2.25 per cubic yard, prior to issuance of the authorization. Do not provide payment until requested by department staff. Please note that a waiver of the severed dredge material payment may be requested and approved when: (a) the materials are being placed on public property and used for public purposed; or (b) it is affirmatively demonstrated that the severed dredge material has no economic value. If you choose to pursue a waiver using option (b) above, provide a certified engineer's report regarding the economic value. If you choose to pursue a waiver using option (b) above, provide a certified engineer's report regarding the economic value of the material to be dredged. The report must contain a sieve analysis indicating the percentage of material by grain size passing through a No. 200 sieve and must reflect that several samples were taken throughout the proposed dredge area. Refer to the enclosed package for specific requirements and information. FDEP-C a.i.2

ii. Public Easement (Peninsula)

(Chapters 18-18, 18-20 or 18-21, Florida Administrative Code)

1. Florida Power and Light has requested a "perpetual" public easement for the peninsula of land that extends into the Indian River along the

shoreline of the Cape Canaveral Plant. The Department's Title and Land Records Section is reviewing your application to determine if state-owned lands will be affected. If state-owned lands will be affected by your project, we will notify you in writing. Gloria Barber at (850) 245-2720 will handle the upland easement if required.

Public easements do not have an expiration date at this time; therefore a perpetual easement is not necessary. FDEP-C a.ii.1

iii. Lease Modification (Barge Slip)

(Chapters 18-18, 18-20 or 18-21, Florida Administrative Code)

1. The area under lease at the Cape Canaveral Plant is currently under review by the Department for an Environmental Resource Permit and Lease Modification to construct an additional boat slip adjacent to the existing facilities. In order to reduce processing fees for the applicant and streamline the process, it is recommended that the request for an extended term lease be filed in conjunction with the existing application, file number 05-290819-001.

The Department does not grant "perpetual" leases. There are instances, however, where extended term leases of 25 years may be granted. The applicant must specify in writing their request and reasons for an extended term lease in accordance with the guidance below. FDEP-C a.iii.1

18-21.008(2) F.A.C. Extended Term Leases.

(a) Extended term leases are those leases with terms in excess of those allowable for standard leases. Extended term leases shall be available for terms up to 25 years. Extended term leases shall be available for existing or proposed facilities or activities, including Grandfathered Registered Structures being brought under lease in accordance with Rule 18-21.00405, F.A.C., where the use of the sovereignty submerged lands and the associated existing or proposed structures on sovereignty submerged lands have or will have an expected life, or amortization period, equal to or greater than the requested lease term and where the applicant has demonstrated that:

1. The facility or activity provides access to public waters and sovereignty submerged lands for the general public on a first-come, first-served basis;

2. The facility is constructed, operated or maintained by government, or funded by government secured bonds with a term greater than or equal to the requested lease term; or

3. The applicant demonstrates that an extended term is necessary to satisfy unique operational constraints.

b. Water Resource Management (Water Facilities)

i. Ground Water

1. Please note that all existing ground water monitoring wells shall remain active and the quarterly ground water monitoring shall be carried out as per the ground water monitoring plan described in the current permit until all groundwater discharges cease and new plant is constructed and put in use by discharging all industrial waste streams in surface water as proposed. Please acknowledge. FDEP-C b.i.1

2. Because the facility is granted the Water Quality Criteria Exemption of Secondary Drinking Water Standards by virtue of an existing installation, the Department proposes to continue groundwater monitoring for several Secondary Parameters (Total Dissolved Solids, Chloride, Sulfate, Aluminum, Manganese and Silver) on an annual basis in existing monitor wells after the new plant becomes operational. Please acknowledge. FDEP-C b.i.2

3. The facility has been granted the Water Quality Criteria Exemption for the Primary Drinking Water Standard Sodium since September 28, 1994 and this Exemption will expire on August 9, 2010. Please be advised that even though the old plant will be demolished with elimination of groundwater discharges, the renewal of Exemption for Sodium parameter will still have to be pursued in time because of continued exceedances of this parameter above the Maximum Contaminant Level (MCL) in groundwater at several well locations and this Exemption will stand alone after new plant operations become effective. Please acknowledge. FDEP-C b.i.3

ii. Stormwater

In accordance with Rule 40C-42.026(1)(c), F.A.C., demonstrate that the required water quality treatment volume will recover within 72 hours following a storm event assuming average antecedent moisture conditions. The storage volume must be provided by a decrease of stored water caused only by percolation through soil, evaporation or evapotranspiration. Include all site specific geotechnical information supporting the estimated seasonal high groundwater elevation and hydraulic conductivity values used in the recovery analysis. If this information was submitted previously, please direct the reviewer to the location where it can be found. FDEP-C b.ii

B. SITING COORDINATION OFFICE

1. Describe how the conversion of the Cape Canaveral plant from the existing dual-fuel fired generation units to a conventional gas fired combined cycle plant will potentially lower carbon emissions. FDEP-SCO 1

2. To what extent has FPL evaluated the feasibility of processes to capture CO_2 from any of its plants in Florida? Provide any reviews conducted or plans to conduct assessments regarding the availability of deep confined geological strata within

From: Bradner, James [mailto:James.Bradner@dep.state.fl.us]
Sent: Monday, February 09, 2009 5:11 PM
To: Harris, Marc; Seiler, Ann; Ferraro, Chris; Lorne, Jacquelyn
Cc: Desai, Anil
Subject: RE: FPL/Cape Canaveral - Siting Application

Good afternoon, everyone:

Here is the missing paragraph, which should have been number 4 under the ground water comments:

FDEP-C b.i.4

> Primary Drinking Water Standard Antimony continues to be violated in groundwater at well location OB-5 above the MCL of 6 ug/L. Please continue to implement the actions the facility conveyed to the Department in the letter dated May 22, 2008 until a complete compliance is achieved in groundwater for this parameter at this well location. If the groundwater compliance is not achieved at this well location prior to the issuance of Site Certification for the construction of new plant, a Consent Order will have to be issued along with the Site Certification to address the antimony concerns in groundwater. The Consent Order will require defining the extent of the groundwater plume and remedial measures with a time frame to achieve the groundwater compliance.

This appears to be my error, and I apologize for any problems the omission might have caused. You're welcome to call or reply to this message if you need further information.

Thanks,

Jim

James N. Bradner, P.E.
Air Program Administrator
FDEP Central District

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey. Thank you in advance for completing the survey.

a reasonable distance (e.g. <200 kilometers) of the plant site for possible future CO_2 storage. FDEP-SCO 2

3. Please submit summary information indicative of the outreach efforts which were extended to potentially affected persons in the vicinity of the power plant. Furthermore, the applicant should be advised that Governor Crist approved House Bill 7135 on June 25th. Accordingly, this Office requests that Progress Energy make a good faith effort to comply with the new Statutory requirements, including those below from 403.5115(6), F.S:

(a) A good faith effort shall be made by the applicant to provide direct written notice of the filing of an application for certification by United States mail or hand delivery no later than 45 days after filing of the application to all local landowners whose property, as noted in the most recent local government tax records, and residences are located within the following distances of the proposed project:

1. Three miles of the proposed main site boundaries of the proposed electrical power plant.

2. One-quarter mile for a transmission line corridor that only includes a transmission line as defined by s. 403.522(22).

3. One-quarter mile for all other linear associated facilities extending away from the main site boundary except for a transmission line corridor that includes a transmission line that operates below those defined by s. 403.522(22).

(b) No later than 60 days from the filing of an application for certification, the applicant shall file a list with the department's Siting Coordination Office of landowners and residences that were notified. FDEP-SCO 3

ITEM II: DEPARTMENT OF COMMUNITY AFFAIRS

The applicant has stated that the City of Cocoa will be the source of potable and process water for the proposed power plant. In order to further evaluate this application, the Department of Community Affairs requests documentation such as a letter of agreement or contract with the City of Cocoa committing to provide the water supply in the amount required for the facility. DCA 1

ITEM III: FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC)

A. Mitigation for any impacts to scrub jays (page 5-13) would be conducted through "The Brevard County Scrub Conservation and Development Plan (SCDP)." The document states that the SCDP is an approved Habitat Conservation Plan (HCP) for Brevard County. Our consultation with U.S. Fish and Wildlife Service staff indicates that Brevard County has not received approval for a Scrub Jay HCP, and unavoidable impacts to scrub jays would also require an incidental take permit from the FWC. FWC A

B. Depending on review of the information requests following, the FWC may request additional wildlife surveys, to be conducted no longer than six months prior to initiating construction to determine if additional state-listed fish and wildlife species are present on the site. This list is found in Chapter 68A-27, Florida Administrative Code, which is available online at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.003 for Endangered species; at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.004 for Threatened species; and at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.005 for Species of Special Concern. FWC B

C. If there is evidence that any individuals of these species are present, then the Licensee must report the findings to the FWC. If impacts to these species cannot be avoided, then the Licensee must contact the FWC before taking any action that might result in an impact to those species. FWC C

D. Section 2.1.3

a. Please provide the latitude/longitude for the St. Johns River Water Management District's water temperature station that was used to obtain the long term data used in the modeling study. FWC Da

b. Ambient water temperature data collected by the FWC during the winter of 1999 in the Indian River Lagoon at Titusville recorded a low temperature of 8.87" C on 11511 999. Also, during the 1989-90 manatee die-off event in Brevard, intake temperatures at the FPL and OUC plants dropped to 8" C (46" F). The FWC requests that FPL run the thermal discharge model again using the 8" C temperature to better reflect recorded lows for the Indian River Lagoon. After running the model with the lower ambient water temperatures, please provide similar graphics to those in the thermal study that represent the pertinent isotherms in the vicinity of the current and interim thermal discharges. In addition, the model was run at full load (100% plant capacity). FWC Db

c. What is needed from the perspective of manatee conservation are model runs based on the minimum expected capacity of the repowered plant during winter. This would provide a range of realistic scenarios for the extent of the new plume. FWC Dc

d. Additionally, we would also like a corresponding table of area of water above 68" F in relation to ambient temperatures ranging from 10" C to 20" C. The EQTP model used to simulate the thermal plume is based on cooling pond thermal dynamics and assumes that all heat loss is through the air-water interface (radiation, evaporation, conduction) and none through mixing or dilution with ambient waters. FWC Dd

e. Does this provide a realistic view of the hydrological conditions found in the Indian River at the Canaveral plant? Effects of mixing due to tides and currents have been observed in the dynamics of cooling water discharge fields (Davies et al. 1997). * FWC De

* Davies, P.A., L.A. Mofor, and M.J. Valente Neves. 1997. Comparisons of remotely sensed observations with modeling predictions for the behavior of wastewater plumes from coastal discharges. International Journal of Remote Sensing 18: 1987-201 9.

f. Has the FPL model been tested (i.e., compared to empirical data) to confirm that the effect of water mixing due to currents and tides does not significantly affect the shape and volume of the warm water plume? If not, then FPL should ground-truth model results in winter to check validity of assumptions with existing or new data. Volume and 3-D shape of the thermal plume may have important implications for manatee carrying capacity. The EQTP model developed by Golder Associates, Inc., is a good effort to understand variation in size of warm water refuge at Cape Canaveral plant after repowering and at the temporary thermal refuge; however, the water plume extension (at least the 68°F isotherm) should also be monitored through on-site measurements (water column temperature profiles and aerial thermal images). These observations would be very useful if conducted concurrently with studies of manatee behavior at the site. FWC Df

E. Section 2.2

a. Please provide additional detail regarding the temporary heating system that may be used (e.g., potential manufacturers) and a site plan showing proposed locations of the electrical heating units, intake, discharge locations and connecting pipelines. FWC Ea

F. Section 5.1.1

a. This section indicates that in-water construction will be required within the intake and discharge canals. Please describe what work in these areas is necessary and what type of on-water access may be needed (vessels, divers, timing of activities-daylight, etc.). FWC Fa

b. This section also indicates that maintenance dredging may be performed at the intake and barge canals. When will this activity be performed in reference to the deconstruction and construction phases of the repowering? FWC Fb

c. Please provide site plans of the areas expected to be dredged and please indicate if any marine resources (seagrass, oysters, etc.) will be affected by the dredging. FWC Fc

d. What type of dredge will be used (cutterhead, clam shell, hopper)? FWC Fd

e. Will the spoil be placed on the barge peninsula per the nationwide permit? If so, how will the spoil be contained and when would the spoil be removed? FWC Fe

G. Section 5.2

a. This section indicates that explosives will be used to dismantle existing plant facilities. Due to the proximity of these structures to the Indian River and the warm-water discharge that is used by manatees, what precautions will be used to insure debris will not reach this area during explosive demolitions? FWC Ga

H. Section 5.4.2.2 - The Manatee Construction Conditions for In-Water Work dated 2005 are the current and appropriate construction conditions to use for all in-water work. FWC Ha

I. Section 6.2.3

a. Is FPL Canaveral collecting ambient and discharge water temperatures? FWC Ia

b. If so, how often are these temperatures collected and at what locations are they collected? FWC Ib

c. Because the plant modifications would result in a 25% reduction of flow from the thermal discharge, FWC believes water temperature monitoring should be conducted in the vicinity of the thermal discharge to document pre- and post-construction temperature regimes. FWC Ic

J. Appendix 10.2.1, Form 2CS Attachment B-2

a. Please verify, as generally stated in this appendix, that no modifications to the intake and discharge structures, screens or intake and discharge pipes are planned. FWC Ja

b. Please provide site plans and cut-sheets for any new or modified structures and discharge or intake pipes. FWC Jb

K. Appendix 10.9 Cape Canaveral Energy Center Project Thermal Discharge Modeling Study

a. Interim Warm-Water Refuge

i. Did FPL do any 3-D modeling of the interim refuge plume? FWC K.a.i

ii. Do they expect the entire water body within the enclosed part of the intake canal to be relatively homogeneous in temperature? Or will there be temperature stratification, such that only certain depths will provide sufficient temperatures for manatee thermoregulation? FWC K.a.ii

iii. The FWC believes it is important for FPL to test the ability of the new unit to create an effective thermal refuge during winter 2009-1 0, because that provides time to monitor the plume, identify problems or deficiencies, and modify the system before the main plant goes offline. This test would include measuring and monitoring the thermal plume under a range of ambient temperatures to truth and refine the model. Such monitoring should continue into the three winters of the shutdown. FWC K.a.iii

iv. How quickly can FPL warm the interim thermal refuge to equilibrium state from a cold start? FWC K.a.iv

v. If a matter of days, how will it be determined whether the ambient water temperature will be expected to drop below the trigger temperature? FWC K.a.v

vi. Manatees could suffer if there are extended periods of cool weather that only moderately exceeds the 61" F threshold. FPL will need to consider weather forecasts and work with the FWC and U.S. Fish and Wildlife Service (USFWS) managers to provide warm water if needed to avoid manatee morbidity and mortality. FWC K.a.vi

b. Monitoring and Long-Term Plans

i. Manatee monitoring plans will be required in this permit with specific requirements to be agreed upon by FWC, USFWS, and the Florida Department of Environmental Protection. Monitoring plans need to include the time frame beginning one year in advance of construction, during the construction phase and post construction. Monitoring efforts shall include aspects of manatee behavior and distribution during the repowering effort. Manipulation of the interim warm-water refuge as part of the monitoring plan should be discussed by FPL, USFWS, and FWC as a technique to enhance our understanding of manatee response to the loss of industrial warm-water habitat. FWC K.b.i

ii. Long-Term Plan - Post-construction, and within an agreed upon timeframe, the FWC, USFWS, and FPL will need to develop a plan to minimize adverse affects to manatees that provides for the weaning of manatees from the repowered FPL Canaveral warm-water discharge and/or establishing an alternative warm-water resource area prior to the plant significantly reducing operations or permanently being retired. FWC K.b.ii

c. Marine Resources

i. Has FPL conducted any marine resource monitoring (seagrass, oyster, fishery, etc.) in the vicinity of the Canaveral facility to determine the affects of the plant's intake and thermal discharge on the Indian River Lagoon's natural resources? If so, please provide the FWC any reports or information associated with these monitoring programs. FWC K.c.i

ii. Has FPL provided compensatory mitigation for any marine resource impacts from the construction or operation of the original Canaveral facility? FWC K.c.ii

iii. Has FPL planned any marine habitat monitoring post construction to determine the affects of the reduced thermal discharge will have on marine resources such as seagrass? FWC K.c.iii

ITEM IV: ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

A. Please provide the detailed engineering calculations that were used to determine the cooling and process water usage in the new plant and/or provide calculations and operational data from a similar plant. [Paragraphs 10.3(a, b), Applicant's Handbook: Consumptive Uses of Water (August 12, 2008), hereinafter A. H.] SJRWMD A

B. On page 6-4, Impacts on Water Supplies, Groundwater, the application states that cooling water for the pump seals wit1 continue to be withdrawn from the surficial aquifer through pumps located within the intake structure. It is noted elsewhere in the application that the source of this water is the Indian River Lagoon. You indicated in our meeting on January 27, 2009, that there are at least two surficial aquifer wells adjacent to the intake structure that are the source of this water. The District's database does not include these surficial aquifer wells. Please provide details on the wells (diameter, depth location etc.) and usage. Please evaluate utilizing Indian River Lagoon water for this use. SJRWMD B1 SJRWMD B2

It is also noted in this section that all surficial aquifer wells will be abandoned. Please clarify the reference to groundwater and the surficial aquifer in this section. Please provide an abandonment schedule for these wells. [Paragraphs 10.3(a, c), A.H.; Rule 40C-3.041, Florida Administrative Code, hereinafter, F.A.C.] SJRWMD B3 SJRWMD B4

C. On pages 6-4 and 6-5, Impacts on Water Supplies, Drinking Water, the application states that average annual municipal water demand will increase by approximately 1 5 percent to 283,680 gpd (1 03.5 mgy). Is this due to increased use in the heat recovery steam generators (HRSGs) and/or onsite or irrigation usages? [Paragraph 10.3(a), A.H.] SJRWMD C

D. You noted in the application that FPL evaluated the economic, environmental and technologic feasibility of using reclaimed water as process water at the facility and found it to be infeasible due to the following reasons:

- unreliability in water quantity and quality from the reclaimed source;
- potential upsets at the plant (related to water quality);
- high cost for additional treatment, and
- potential for exceeding TMDLs in the discharge to the Indian River Lagoon.

FPL submitted documentation, dated May 23, 2008, summarizing this analysis, and noted in the application that the District concurred. Have circumstances changed at the reclaimed facility in terms of reliability, quantity and quality since the time the evaluation was completed (2003; data from 2000 to 2003), that may allow use of this lower quality water source? Please evaluate the potential for using reclaimed water for landscape irrigation at the site. Since landscape irrigation is included in the project, please complete the Landscape Irrigation Type Use form (UL-1). District rule requires using the lowest acceptable quality water source, including reclaimed water for each consumptive use. In light of the fact that this is a new plant, the reclaimed pipeline is already constructed, and circumstances at the reclaimed plant may be more favorable for this use, it will be necessary to evaluate if it is economically, environmentally, or SJRWMD D1 SJRWMD D2 SJRWMD D3

technologically feasible to use this source. [Paragraphs 10.3(e, f, g), A.H.; Rule 40C-2.101, F.A.C.] SJRWMD D4

E. Construction dewatering is described on p. 5-8. Please complete the applicable sections of the Dewatering Type Use form (DW-?). [Rule 40C-2.101, F.A.C.] SJRWMD E

ITEM V: EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

A. As indicated in the report, a temporary manatee heating system will be implemented to create a refuge for the manatees that frequent the current discharge area during the time when the ambient water temperature falls below 61 F.

a. How will the effectiveness of this heating system be evaluated? ECFRPC A.a

b. Is there a plan in place to monitor the manatees and their response to the heating system? ECFRPC A.b

B. The FPL Cape Canaveral Manatee Protection Plan was not included in the report as an attachment. ECFRPC B

C. Scrub jay and gopher tortoise habitat is found adjacent to the site. Although the report states no noise sensitive wildlife is known to occur in the vicinity of the site and wildlife in the area would have been acclimated to noise associated with Plant Operations;

a. Will ground vibrations during the 3 year construction project negatively impact the species, especially gopher tortoise? ECFRPC C.a

b. Is there a monitoring plan in place to determine if the species are adversely affected or displaced over a period of time? ECFRPC C.b

ITEM VI: BREVARD COUNTY

A. The parcels and boundary shown on the landscape plans, sheets 1 and **2,** do not match the boundary shown on sheet 4-A of the conceptual site plan. BCBOCC A

B. The legal description in the Ownership and Encumbrance (O&E) report for the property on the Wed side of US-1 must match the legal description on the conceptual site plan and the boundary survey of the property. Provide 2 signed & sealed boundary & topographic surveys which have been prepared with the benefit of the O&E **report** so that all matters of record can be shown (if plottable) and/or noted on the survey (if the easements are no longer applicable or do not encumber the property the survey must note this in a note on the survey.) BCBOCC B

C. The O&E report which was provided has descriptions of 17 parcels, whereas the survey of the parcel lying east of US Highway 1, only uses descriptions 5 **thru** 17 (please explain.) Is the property that is to be used for the lay down area described in the O&E report as parcels 1 thru 4? If so, the survey that was provided does not match any of the remaining legals in the O&E report. BCBOCC C

D. The location and width of existing easements and proposed easements must be shown on the site plan. Their intended use shall be clearly stated. Where easements are not coincident with property lines, they must be labeled with bearings and distances and tied to project site boundary lines. The O&E report identifies numerous easements (6 counted) which are not shown on the survey. All these easements must be accounted for whether they are shown graphically on the survey or noted as "no longer" or "does not" encumber subject property. Please modify survey note **#2** if needed **(It** does not appear that the surveyor prepared these descriptions. It appears that the descriptions are from deeds of record.) BCBOCC D

E. The Construction Lay down and Parking Area sheet (4A) is different from the areas shown on sheets L-1 and L-2 of the landscaping plan. Are the areas shown on Sheets L-1 and L-2 included in the SAC? If so, please revise Ownership and encumbrance report, SAC, conceptual site plan and the boundary survey to include the property**.** BCBOCC E

F. Provide the Storm Water Pollution Prevention Plan **(**SWPPP**)** for the project construction site on the east and west side of US-1. Also, depict all the improvements that are listed in section 4.8.1.2 and section 4.8.2. of the SCA. BCBOCC F

G. The ability to impact jurisdictional wetlands shall be evaluated according to Brevard County Comprehensive Plan, Conservation Element, Objective 5. Any impacts to state-claimed jurisdiction wetlands will require a Board of County Commissioners Public Interest Determination (PID). If the State does not claim the delineated "wetlands" shown on Sheets 6 & 7 of the Boundary Survey as jurisdictional, please provide documentation and this will not be necessary. BCBOCC G

H. Redevelopment of legally existing impacts within the buffer is permissible; however, new impacts (temporary or permanent) in the surface water protection buffer will require a Board of County Commissioners PID. This request shall be required for completeness. As discussed in our meeting of January 22, 2009, this would best be approached by requesting the general ability to impact the surface water protection buffer **as** required as part of plant operations or manatee protection. BCBOCC H

I. Maintenance dredging requires Board of County Commissioners approval. This request shall be required for completeness. As discussed in our meeting of January 22,

2009, please supply the details regarding the proposed maintenance dredging and associated FDEP exemption documentation. BCBOCC I

ITEM VII: DEPARTMENT OF STATE

A. DIVISION OF HISTORICAL RESOURCES

a. A review of the application and our files indicates that the immediate FPL Cape Canaveral Energy Center (CCEC) property and two adjacent construction lay down areas to the west were subjected to limited cultural resource investigations in 2008 by Janus Research of Tampa, Florida for Golder Associates. Only the CCEC plant survey was submitted to this office prior to receipt of the reference application. No cultural resources (archaeological sites, buildings or structures) were identified within the CCEC or lay down areas. It is the opinion of this agency and we concur with the findings of Janus Research that it is unlikely that significant cultural resources will be encountered within the CCEC area of potential affect as was defined in their survey coverage. However, the area of potential effect did not address indirect affects – such as noise, lights and emissions - to cultural resources within a 1-mile radius from the CCEC site; nor possible deeply buried cultural deposits that the standard archaeological field methodology will not discover. We request that the applicant address any potential indirect affects; and develop and present a unexpected cultural resource discoveries training plan for demolition and construction contractors and project managers for review and approval by this agency. DHR - Aa

b. In addition, we request that the two lay down properties be subjected to standard archaeological field investigations, including subsurface testing. We note that U.S. Highway 1 is parallels the western boundary of the CCEC plant property. Any alterations or changes to the linear roadway resource must be addressed in a supplemental cultural resource assessment. DHR - Ab

c. Lastly, if new transmission line corridors or replacement transmission lines will be constructed in association with the CCEC that have not previously been surveyed, they will need to be investigated to determine if cultural resources are present and if such resources could be adversely impacted. DHR - Ac

Attached please find a copy of submitted letters/comments from Department of Community Affairs, Florida Fish and Wildlife Conservation Commission, St. Johns River Water Management District, East Central Florida Regional Planning Council, Department of State – Division of Historical Resources and Brevard County.

BREVARD County
BOARD OF COUNTY COMMISSIONERS

FLORIDA'S SPACE COAST

Permitting and Enforcement Department
2725 Judge Fran Jamieson Way, Bldg. A, Suite 101
Viera, Florida 32940
(321) 690-6875 Facsimile: (321) 690-6838

January 29, 2009

Ann Seiler
Department of Environmental Protection
Siting Coordination Office
3900 Commonwealth Blvd.
Tallahassee, FL 32399

Re: Site Certification Application Completeness Review - Cape Canaveral Energy Center

Dear Ms. Seiler,

Thank you for the opportunity to provide input on the completeness of the Site Certification Application (SCA) for the Cape Canaveral Energy Center. Brevard County staff has completed our review of the SCA and has determined that additional information is needed for purposes of our site plan review. It is our determination that the information provided in the application is not complete.

The following identifies the necessary information to complete the SAC:

1. The parcels and boundary shown on the landscape plans, sheets 1 and 2, do not match the boundary shown on sheet 4-A of the conceptual site plan.

2. The legal description in the Ownership and Encumbrance (O&E) report for the property on the West side of US-1 must match the legal description on the conceptual site plan and the boundary survey of the property. Provide 2 signed & sealed boundary & topographic surveys which have been prepared with the benefit of the O&E report so that all matters of record can be shown (if plottable) and/or noted on the survey (if the easements are no longer applicable or do not encumber the property the survey must note this in a note on the survey.)

3. The O&E report which was provided has descriptions of 17 parcels, whereas the survey of the parcel lying east of US Highway 1, only uses descriptions 5 thru 17 (please explain.) Is the property that is to be used for the lay down area described in the O&E report as parcels 1 thru 4? If so the survey that was provided does not match any of the remaining legals in the O&E report.

4. The location and width of existing easements and proposed easements must be shown on the site plan. Their intended use shall be clearly stated. Where easements are not coincident with property lines, they must be labeled with bearings and distances and tied to project site boundary lines. The O&E report identifies numerous easements (6 counted) which are not shown on the survey. All these easements must be accounted for whether they are shown graphically on the survey or noted as "no longer" or "does not" encumber subject property. Please modify survey note #2 if needed (It does not appear that the surveyor prepared these descriptions. It appears that the descriptions are from deeds of record.)

5. The Construction Laydown and Parking Area sheet (4A) is different from the areas shown on sheets L-1 and L-2 of the landscaping plan. Are the areas shown on Sheets L-1 and L-2 included in the SAC? If so, please revise Ownership and Encumbrance report, SAC, conceptual site plan and the boundary survey to include the property.

6. Provide the Storm Water Pollution Prevention Plan (SWPPP) for the project construction site on the east and west side of US-1. Also, depict all the improvements that are listed in section 4.8.1.2 and section 4.8.2. of the SCA.

7. The ability to impact jurisdictional wetlands shall be evaluated according to Brevard County Comprehensive Plan, Conservation Element, Objective 5. Any impacts to state-claimed jurisdiction wetlands will require a Board of County Commissioners Public Interest Determination (PID). If the State does not claim the delineated "wetlands" shown on Sheets 6 & 7 of the Boundary Survey as jurisdictional, please provide documentation and this will not be necessary.

8. Redevelopment of legally existing impacts within the buffer is permissible; however, new impacts (temporary or permanent) in the surface water protection buffer will require a Board of County Commissioners PID. This request shall be required for completeness. As discussed in our meeting of January 22, 2009, this would best be approached by requesting the general ability to impact the surface water protection buffer as required as part of plant operations or manatee protection.

9. Maintenance dredging requires Board of County Commissioners approval. This request shall be required for completeness. As discussed in our meeting of January 22, 2009, please supply the details regarding the proposed maintenance dredging and associated FDEP exemption documentation.

Should you have any questions, please call Ed Lyon or Rebecca Ragain at 321-633-2065.

Sincerely,

Mel Scott, Assistant County Manager
Brevard County, Florida

Seiler, Ann

From: Shaun.Fountain@dca.state.fl.us
Sent: Thursday, January 29, 2009 1:26 PM
To: Seiler, Ann
Cc: Halpin, Mike; Barbara.Lenczewski@dca.state.fl.us; Craig.Diamond@dca.state.fl.us
Subject: Completeness Statement for Cape Canaveral Energy Center (CCEC)

Ann,

The applicant has stated that the City of Cocoa will be the source of potable and process water for the proposed power plant. In order to further evaluate this application, the Department of Community Affairs requests documentation such as a letter of agreement or contract with the City of Cocoa committing to provide the water supply in the amount required for the facility.

Respectfully,

Shaun Fountain
GIS/Community Planner
Florida Department of Community Affairs
Division of Community Planning
2555 Shumard Oak Blvd.
Tallahassee, FL 32399
(850) 922-1789
shaun.fountain@dca.state.fl.us

We are committed to maintaining the highest level of service and we value your feedback. Please complete our Customer Service Survey by visiting http://www.dca.state.fl.us/CustomerServiceSurvey/. However, if you require direct assistance or a response, please visit http://www.dca.state.fl.us/contactus/.

Affordable, quality health insurance coverage is now available for any uninsured Floridians ages 19-64. To learn more, visit www.CoverFloridaHealthCare.com.

Florida has a broad public records law and all correspondence, including email addresses, may be subject to disclosure.

FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

February 4, 2009

Mr. Michael P. Halpin, P.E.
Siting Administrator
Florida Department of Environmental Protection
2600 Blair Stone Road, Suite 649, MS #48
Tallahassee, Florida 32399-2400

Re: DHR Project No.: 2008-8137
Date Received by DHR: December 30, 2008
FPL Cape Canaveral Energy Center
Application for Site Certification
Brevard County

Dear Mr. Halpin:

Our office reviewed the referenced siting application in accordance with Chapters 403 and 267, *Florida Statutes*, for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical, architectural or archaeological significance. The State Historic Preservation Officer/Division of Historical Resources advises and assists state agencies and applicants to identify historic properties, assessing effects upon them, and considering alternatives to avoid or minimize adverse effects.

A review of the application and our files indicates that the immediate FPL Cape Canaveral Energy Center (CCEC) property and two adjacent construction laydown areas to the west were subjected to limited cultural resource investigations in 2008 by Janus Research of Tampa, Florida for Golder Associates. Only the CCEC plant survey was submitted to this office prior to receipt of the reference application. No cultural resources (archaeological sites, buildings or structures) were identified within the CCEC or laydown areas.

It is the opinion of this agency and we concur with the findings of Janus Research that it is unlikely that significant cultural resources will be encountered within the CCEC area of potential affect as was defined in their survey coverage. However, the area of potential effect did not address indirect affects – such as noise, lights and emissions - to cultural resources within

a 1-mile radius from the CCEC site; nor possible deeply buried cultural deposits that the standard archaeological field methodology will not discover. We request that the applicant address any potential indirect affects; and develop and present a unexpected cultural resource discoveries training plan for demolition and construction contractors and project managers for review and approval by this agency.

In addition, we request that the two laydown properties be subjected to standard archaeological field investigations, including subsurface testing. We note that U.S. Highway 1 is parallels the western boundary of the CCEC plant property. Any alterations or changes to the linear roadway resource must be addressed in a supplemental cultural resource assessment.

Lastly, if new transmission line corridors or replacement transmission lines will be constructed in association with the CCEC that have not previously been surveyed, they will need to be investigated to determine if cultural resources are present and if such resources could be adversely impacted.

Therefore, until completion of the requested investigations and submission of supplemental investigation reports for review and comment, and a commitment from FPL to develop an approved contractor training plan, this agency cannot approve the project as presented in this application.

If you have any questions concerning our comments, please contact Laura Kammerer, Deputy State Historic Preservation Officer for Review and Compliance, by telephone at 850-245-6333, or by electronic mail at lkammerer at dos.state.fl.us. Thank you for your interest in protecting Florida's historic properties.

Sincerely,

Frederick P. Gaske, Director, and
State Historic Preservation Officer

Enclosure

Seiler, Ann

From: Menchion, Kimberly [Kimberly.Menchion@dot.state.fl.us]
Sent: Thursday, January 29, 2009 12:34 PM
To: Seiler, Ann
Subject: RE: Information - Cape Canaveral PA08-53

Hello Ann,

This application is considered complete.

Sincerely,

Kimberly Clark Menchion, Esq.
Assistant General Counsel
Florida Department of Transportation
Office of the General Counsel
605 Suwannee Street, M.S. 58
Tallahassee, Florida 32399-0458
Phone: (850) 414-5294
Fax: (850) 414-5264

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From: Seiler, Ann [mailto:Ann.Seiler@dep.state.fl.us]
Sent: Wednesday, January 14, 2009 11:47 AM
To: Riddle, Andrew; Barbara.Lenczewski@dca.state.fl.us; Barton Bibler; Bradner, James; Christine Lepore; Mitchell, Connie; dkeesee@cocoafl.org; dselig@cocoafl.org; Dwight W. Severs ; Ernie Brown; hbyron@cocoafl.org; james.antista@fwc.state.fl.us; jbrubake@psc.state.fl.us; watsonf@doacs.state.fl.us; Weiss, Jon; kelly.martinson@dca.state.fl.us; Menchion, Kimberly; Laura Kammerer; Mary Ellen Winkler; Maryann Poole; Matt Chesnut; Pat Renish; patti_anderson@doh.state.fl.us; plaurien@ecfrpc.org; Rebecca Ragain; Richard Burklew; Rick Enos; Robin Sobrino; Shaun Fountain; Stephen Lau; tara@ecfrpc.org; Tom Ballinger
Cc: PETER C CUNNINGHAM; Chisolm, Jack; Halpin, Mike
Subject: Information - Cape Canaveral PA08-53

Hello everyone,

Thank you to everyone for responding to my initial email of who would be the proper contact from your agency to review this application. You will be able to locate a lot of information, should you need to, at our website on the Cape Canaveral application as well as links to the Division of Administrative Hearing (DOAH) and Public Service Commission (PSC) dockets relative to this case. http://www.dep.state.fl.us/siting/Highlights/applications.htm#3._FPL_Cape_Canaveral_Energy_Center_

The schedule for this application process has been approved by the Administrative Law Judge (ALJ) and can be located here; http://www.doah.state.fl.us/docdoc/2009/000039/09000039M-011209-13453345.PDF

As a reminder, your first deadline to determine whether the application has enough information in it to be considered complete is due to me on **January 29, 2009**. The format to submit this will be a written statement containing each agency's recommendations on the completeness of the application.

If you have any question concerning the process, please do not hesitate to contact me.

Thank you, Ann

Ann Seiler
Environmental Specialist
Department of Environmental Protection
Siting Coordination Office
3900 Commonwealth Blvd.
Tallahassee, FL 32399
(850) 245-2143
ann.seiler@dep.state.fl.us

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey. Thank you in advance for completing the survey.

East Central Florida Regional Planning Council

631 North Wymore Road, Suite 100 • Maitland, FL 32751
Phone 407.623.1075 • Fax 407.623.1084 • www.ecfrpc.org

Philip Laurien, AICP
Executive Director

January 23, 2009

Ann Seiler
Siting Coordination Office
Florida Department of Environmental Protection
3900 Commonwealth Blvd
Tallahassee, FL 32399

RE: Cape Canaveral Energy Center Site Certification Application

Dear Ms. Seiler,

The East Central Florida Regional Planning Council staff has conducted the completeness review of the Site Certification Application for the Cape Canaveral Energy Center pursuant to 403.5066, F.S.

We have questions related to the ecosystems for listed species. As indicated in the report, a temporary manatee heating system will be implemented to create a refuge for the manatees that frequent the current discharge area during the time when the ambient water temperature falls below 61 F.

- How will the effectiveness of this heating system be evaluated?
- Is there a plan in place to monitor the manatees and their response to the heating system?

The FPL Cape Canaveral Manatee Protection Plan was not included in the report as an attachment.

Scrub jay and gopher tortoise habitat is found adjacent to the site. Although the report states no noise sensitive wildlife is known to occur in the vicinity of the site and wildlife in the area would have been acclimated to noise associated with Plant Operations, will ground vibrations during the 3 year construction project negatively impact the species, especially gopher tortoise? Is there a monitoring plan in place to determine if the species are adversely affected or displaced over a period of time?

Sincerely,

Phil Laurien, Executive Director

Executive Committee

Chair	Vice Chair	Treasurer	Secretary	Member At Large
Malcolm McLouth	Mary Martin	Cheryl Grieb	Atlee Mercer	Elaine Renick
Governor's Appointee	Vice Mayor of Port Orange	City Commissioner	Property Appraiser	Commissioner
Brevard County	Volusia County League of Cities	City of Kissimmee	Osceola County	Lake County

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Tallahassee

Executive Staff
Kenneth D. Haddad
Executive Director

Nick Wiley
Assistant Executive Director

Karen Ventimiglia
Deputy Chief of Staff

Office of Policy and Stakeholder Coordination
Mary Ann Poole
Director

(850) 410-5272
(850) 922-5679 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

620 South Meridian Street
Tallahassee, Florida
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(800) 955-8770 (V)

MyFWC.com

January 28, 2009

Mr. Mike Halpin, Administrator
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 48
Tallahassee, FL 32399

RE: FPL Cape Canaveral Energy Center Conversion Project, Brevard County

Dear Mr. Halpin:

The Division of Habitat and Species Conservation, Habitat Conservation Scientific Services Section, of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated our agency's review of the Cape Canaveral Energy Center Conversion project and provides the following information requests and comments for consideration in the application completeness review.

Florida Power & Light (FPL) proposes to convert the existing 400-megawatt unit conventional dual-fuel fired boilers to a modern, lower emission energy center using the latest combined-cycle technology. The project would use existing plant site boundaries, cooling water intake and discharge infrastructure, and transmission line right-of way. A staging area to service both construction parking and equipment "laydown" would occur on FPL-owned land adjacent to the existing plant.

The existing plant site is located adjacent to the Indian River Lagoon, east of U.S. Highway 1, and consists of the electric power-generating facilities with a fringe of mangroves along the lagoon shore. A dredged channel and mooring basin is located on the southern portion of the site. The proposed staging area is located west of U.S. Highway 1 and south of the existing power line corridor that exits the plant site to the west. This area contains a combination of grassy open land, upland scrub pines, and hardwoods. Any proposed impacts to the mangrove fringe or changes to the current boat/barge traffic in the basin could have negative impacts to wading birds and the West Indian manatee (*Trichechus manatus*, state- and federally listed as Endangered). Any changes in the amount of water used by the plant or changes to the temperature of the water, or if there is any in-water work, may also affect manatees. Construction impacts to the remainder of the site, primarily at the staging area, has the potential to impact several listed species, including the Florida scrub jay (*Aphelocoma coerulescens,* state- and federally listed as Threatened), eastern indigo snake (*Drymarchon corais couperi,* state- and federally listed as Threatened), gopher tortoise (*Gopherus polyphemus*, state-listed as Threatened) and the Florida mouse (*Podomys floridanus*) and gopher frog (*Rana capito*), both of which are state-listed as Species of Special Concern.

Because this proposed project has the potential to impact manatees, we have enclosed a list of questions and information needs regarding manatees and other marine resources related to the proposed changes to the plant's water use and proposed maintenance dredging. With regard to the staging area, both gopher tortoises and scrub jays have been identified on the site. FPL proposes to relocate gopher tortoises according to FWC

protocol. This relocation would also be utilized to relocate any gopher tortoise commensal (eastern indigo snake, gopher frog, Florida mouse) species found within the tortoise burrows. Mitigation for any impacts to scrub jays (page 5-13) would be conducted through "The Brevard County Scrub Conservation and Development Plan (SCDP)." The document states that the SCDP is an approved Habitat Conservation Plan (HCP) for Brevard County. Our consultation with U.S. Fish and Wildlife Service staff indicates that Brevard County has not received approval for a Scrub Jay HCP, and unavoidable impacts to scrub jays would also require an incidental take permit from the FWC.

Finally, depending on our review of the information requests above, the FWC may request additional wildlife surveys, to be conducted no longer than six months prior to initiating construction to determine if additional state-listed fish and wildlife species are present on the site. This list is found in Chapter 68A-27, Florida Administrative Code, which is available online at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.003 for Endangered species; at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.004 for Threatened species; and at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.005 for Species of Special Concern.

If there is evidence that any individuals of these species are present, then the Licensee must report the findings to the FWC. If impacts to these species cannot be avoided, then the Licensee must contact the FWC before taking any action that might result in an impact to those species.

If you or your staff would like to coordinate further on the recommendations contained in this report, please contact me at 850-410-5272, or email me at maryann.poole@MyFWC.com, and I will be glad to help make the necessary arrangements. If your staff has any specific questions regarding our comments, I encourage them to contact Steve Lau by telephone at 772-778-6354 or by email at steve.lau@MyFWC.com.

Sincerely,

Mary Ann Poole

Mary Ann Poole, Director
Office of Policy and Stakeholder Coordination

map/sl
ENV 2-11-2/3
Cape Canaveral Plant Conversion_1761_RAI
Enclosure
cc: Craig Faulhaber, FWC, Ocala
Ron Mezich, FWC, Tallahassee
Carol Knox, FWC, Tallahassee
Brad Gruver, FWC, Tallahassee

Questions for and Issues to be Addressed in FPL's Cape Canaveral Repowering Siting Application

Section 5.1.1 – This section indicates that in-water construction will be required within the intake and discharge canals. Please describe what work in these areas is necessary and what type of on-water access may be needed (vessels, divers, timing of activities-day/night, etc.).

This section also indicates that maintenance dredging may be performed at the intake and barge canals. When will this activity be performed in reference to the deconstruction and construction phases of the repowering?

Please provide site plans of the areas expected to be dredged and please indicate if any marine resources (seagrass, oysters, etc.) will be affected by the dredging.

What type of dredge will be used (cutterhead, clam shell, hopper)?

Will the spoil be placed on the barge peninsula per the nationwide permit? If so, how will the spoil be contained and when would the spoil be removed?

Section 5.2 – This section indicates that explosives will be used to dismantle existing plant facilities. Due to the proximity of these structures to the Indian River and the warm-water discharge that is used by manatees, what precautions will be used to insure debris will not reach this area during explosive demolitions?

Section 5.4.2.2 – The Manatee Construction Conditions for In-Water Work dated 2005 are the current and appropriate construction conditions to use for all in-water work.

Section 6.2.3 – Is FPL-Canaveral collecting ambient and discharge water temperatures? If so, how often are these temperatures collected and at what locations are they collected?

Because the plant modifications would result in a 25% reduction of flow from the thermal discharge, FWC believes water temperature monitoring should be conducted in the vicinity of the thermal discharge to document pre- and post-construction temperature regimes.

Appendix 10.2.1, Form 2CS Attachment B-2 – Please verify, as generally stated in this appendix, that no modifications to the intake and discharge structures, screens or intake and discharge pipes are planned. Please provide site plans and cut-sheets for any new or modified structures and discharge or intake pipes.

Appendix 10.9 Cape Canaveral Energy Center Project Thermal Discharge Modeling Study

Section 2.1.3 - Please provide the latitude/longitude for the St. Johns River Water Management District's water temperature station that was used to obtain the long-term data used in the modeling study.

Ambient water temperature data collected by the FWC during the winter of 1999 in the Indian River Lagoon at Titusville recorded a low temperature of 8.87° C on 1/5/1999. Also, during the 1989-90 manatee die-off event in Brevard, intake temperatures at the FPL and OUC plants dropped to 8° C (46° F). The FWC requests that FPL run the thermal discharge model again using the 8° C temperature to better reflect recorded lows for the Indian River Lagoon. After running the model with the lower ambient water temperatures, please provide similar graphics to those in the thermal study that represent the pertinent isotherms in the vicinity of the current and interim thermal discharges.

In addition, the model was run at full load (100% plant capacity). What is needed from the perspective of manatee conservation are model runs based on the minimum expected capacity of the repowered plant during winter. This would provide a range of realistic scenarios for the extent of the new plume.

Additionally, we would also like a corresponding table of area of water above 68° F in relation to ambient temperatures ranging from 10° C to 20° C.

The EQTP model used to simulate the thermal plume is based on cooling pond thermal dynamics and assumes that all heat loss is through the air-water interface (radiation, evaporation, conduction) and none through mixing or dilution with ambient waters. Does this provide a realistic view of the hydrological conditions found in the Indian River at the Canaveral plant? Effects of mixing due to tides and currents have been observed in the dynamics of cooling water discharge fields (Davies *et al.* 1997). *

* Davies, P.A., L.A. Mofor, and M.J. Valente Neves. 1997. Comparisons of remotely sensed observations with modeling predictions for the behavior of wastewater plumes from coastal discharges. *International Journal of Remote Sensing* 18:1987-2019.

Has the FPL model been tested (i.e., compared to empirical data) to confirm that the effect of water mixing due to currents and tides does not significantly affect the shape and volume of the warm water plume? If not, then FPL should ground-truth model results in winter to check validity of assumptions with existing or new data. Volume and 3-D shape of the thermal plume may have important implications for manatee carrying capacity. The EQTP model developed by Golder Associates, Inc., is a good effort to understand variation in size of warm water refuge at Cape Canaveral plant after repowering and at the temporary thermal refuge; however, the water plume extension (at least the 68°F isotherm) should also be monitored through on-site measurements (water column temperature profiles and aerial thermal images). These

observations would be very useful if conducted concurrently with studies of manatee behavior at the site.

Interim Warm-Water Refuge

Did FPL do any 3-D modeling of the interim refuge plume? Do they expect the entire water body within the enclosed part of the intake canal to be relatively homogeneous in temperature? Or will there be temperature stratification, such that only certain depths will provide sufficient temperatures for manatee thermoregulation?

The FWC believes it is important for FPL to test the ability of the new unit to create an effective thermal refuge during winter 2009-10, because that provides time to monitor the plume, identify problems or deficiencies, and modify the system before the main plant goes offline. This test would include measuring and monitoring the thermal plume under a range of ambient temperatures to truth and refine the model. Such monitoring should continue into the three winters of the shutdown.

How quickly can FPL warm the interim thermal refuge to equilibrium state from a cold start? If a matter of days, how will it be determined whether the ambient water temperature will be expected to drop below the trigger temperature?

Manatees could suffer if there are extended periods of cool weather that only moderately exceeds the 61° F threshold. FPL will need to consider weather forecasts and work with the FWC and U.S. Fish and Wildlife Service (USFWS) managers to provide warm water if needed to avoid manatee morbidity and mortality.

Section 2.2 – Please provide additional detail regarding the temporary heating system that may be used (e.g., potential manufacturers) and a site plan showing proposed locations of the electrical heating units, intake, discharge locations and connecting pipelines.

Monitoring and Long-Term Plans

Manatee monitoring plans will be required in this permit with specific requirements to be agreed upon by FWC, USFWS, and the Florida Department of Environmental Protection. Monitoring plans need to include the time frame beginning one year in advance of construction, during the construction phase and post construction. Monitoring efforts shall include aspects of manatee behavior and distribution during the repowering effort. Manipulation of the interim warm-water refuge as part of the monitoring plan should be discussed by FPL, USFWS, and FWC as a technique to enhance our understanding of manatee response to the loss of industrial warm-water habitat.

Long-Term Plan – Post-construction, and within an agreed upon timeframe, the FWC, USFWS, and FPL will need to develop a plan to minimize adverse affects to manatees that provides for the weaning of manatees from the repowered FPL-

Canaveral warm-water discharge and/or establishing an alternative warm-water resource area prior to the plant significantly reducing operations or permanently being retired.

Marine Resources

Has FPL conducted any marine resource monitoring (seagrass, oyster, fishery, etc.) in the vicinity of the Canaveral facility to determine the affects of the plant's intake and thermal discharge on the Indian River Lagoon's natural resources? If so, please provide the FWC any reports or information associated with these monitoring programs.

Has FPL provided compensatory mitigation for any marine resource impacts from the construction or operation of the original Canaveral facility?

Has FPL planned any marine habitat monitoring post construction to determine the affects of the reduced thermal discharge will have on marine resources such as seagrass?

Seiler, Ann

From: Jennifer Brubaker [JBrubake@PSC.STATE.FL.US]
Sent: Wednesday, January 14, 2009 1:36 PM
To: Seiler, Ann
Subject: RE: Information - Cape Canaveral PA08-53

Dear Ms. Seiler,

In response to your e-mail below, please note that the Florida Public Service Commission has no questions or objections to the completeness of the Cape Canaveral project identified below.

If you have any questions or need additional information, please do not hesitate to contact me.

Jennifer Brubaker, Attorney Supervisor
Florida Public Service Commission
Office of the General Counsel
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850
Telephone: (850) 413-6228
Facsimile: (850) 413-6229
jbrubake@psc.state.fl.us

From: Seiler, Ann [mailto:Ann.Seiler@dep.state.fl.us]
Sent: Wednesday, January 14, 2009 11:47 AM
To: Andrew Riddle; Barbara.Lenczewski@dca.state.fl.us; Barton Bibler; Bradner, James; Christine Lepore; connie.mitchell@dot.state.fl.us; dkeesee@cocoafl.org; dselig@cocoafl.org; Dwight W. Severs ; Ernie Brown; hbyron@cocoafl.org; james.antista@fwc.state.fl.us; Jennifer Brubaker; watsonf@doacs.state.fl.us; Jon Weiss; kelly.martinson@dca.state.fl.us; Kimberly Menchion; Laura Kammerer; Mary Ellen Winkler; Maryann Poole; Matt Chesnut; Pat Renish; patti_anderson@doh.state.fl.us; plaurien@ecfrpc.org; Rebecca Ragain; Richard Burklew; Rick Enos; Robin Sobrino; Shaun Fountain; Stephen Lau; tara@ecfrpc.org; Tom Ballinger
Cc: PETER C CUNNINGHAM; Chisolm, Jack; Halpin, Mike
Subject: Information - Cape Canaveral PA08-53

Hello everyone,
Thank you to everyone for responding to my initial email of who would be the proper contact from your agency to review this application. You will be able to locate a lot of information, should you need to, at our website on the Cape Canaveral application as well as links to the Division of Administrative Hearing (DOAH) and Public Service Commission (PSC) dockets relative to this case.
http://www.dep.state.fl.us/siting/Highlights/applications.htm#3._FPL_Cape_Canaveral_Energy_Center_
The schedule for this application process has been approved by the Administrative Law Judge (ALJ) and can be located here; http://www.doah.state.fl.us/docdoc/2009/000039/09000039M-011209-13453345.PDF
As a reminder, your first deadline to determine whether the application has enough information in it to be considered complete is due to me on **January 29, 2009**. The format to submit this will be a written statement containing each agency's recommendations on the completeness of the application.
If you have any question concerning the process, please do not hesitate to contact me.
Thank you, Ann

Ann Seiler
Environmental Specialist
Department of Environmental Protection
Siting Coordination Office
3900 Commonwealth Blvd.
Tallahassee, FL 32399

(850) 245-2143
ann.seiler@dep.state.fl.us

The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on this link to the DEP Customer Survey. Thank you in advance for completing the survey.

St. Johns River
Water Management District
Kirby B. Green III, Executive Director • David W. Fisk, Assistant Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500
On the Internet at *www.sjrwmd.com*.

January 27, 2009

Via Electronic Mail and U.S. Mail

Ann Seiler
Environmental Specialist
Department of Environmental Protection
Siting Coordination Office
3900 Commonwealth Blvd.
Tallahassee, FL 32399
ann.seiler@dep.state.fl.us

RE: Florida Power & Light Company
Cape Canaveral Energy Center
Siting Case No. PA08-53; DEP Case No. 08-2971;
DOAH Case No. 09-039EPP; SJRWMD File of Record No. 2009-02

Dear Ms. Seiler:

Pursuant to section 403.5066(1)(a), Florida Statutes, the St. Johns River Water Management District transmits to you its request for additional information which must be provided in order to render this application sufficient to enable the District to carry out its statutory responsibilities. The request below reflects the information the District's technical staff believes is needed to complete the District's review and to thereafter prepare a report to the Department:

1. Please provide the detailed engineering calculations that were used to determine the cooling and process water usage in the new plant and/or provide calculations and operational data from a similar plant. [Paragraphs 10.3(a, b), *Applicant's Handbook: Consumptive Uses of Water (August 12, 2008)*, hereinafter A.H.]

2. On page 6-4, Impacts on Water Supplies, Groundwater, the application states that cooling water for the pump seals will continue to be withdrawn from the surficial aquifer through pumps located within the intake structure. It is noted elsewhere in the application that the source of this water is the Indian River Lagoon. You indicated in our meeting on January 27, 2009, that there are at least two surficial aquifer wells adjacent to the intake structure that are the source of this water. The District's database does not include these surficial aquifer wells. Please provide details on the wells (diameter, depth location etc.) and usage. Please evaluate utilizing Indian River Lagoon water for this use.

GOVERNING BOARD

Susan N. Hughes, CHAIRMAN PONTE VEDRA
W. Leonard Wood, VICE CHAIRMAN FERNANDINA BEACH
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Hans G. Tanzler III, TREASURER JACKSONVILLE
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Michael Ertel OVIEDO
David G. Graham JACKSONVILLE
Arlen N. Jumper FORT McCOY
Ann T. Moore BUNNELL

It is also noted in this section that all surficial aquifer wells will be abandoned. Please clarify the reference to groundwater and the surficial aquifer in this section. Please provide an abandonment schedule for these wells. [Paragraphs 10.3(a, c), A.H.; Rule 40C-3.041, Florida Administrative Code, hereinafter, F.A.C.]

3. On pages 6-4 and 6-5, Impacts on Water Supplies, Drinking Water, the application states that average annual municipal water demand will increase by approximately 15 percent to 283,680 gpd (103.5 mgy). Is this due to increased use in the heat recovery steam generators (HRSGs) and/or onsite or irrigation usages? [Paragraph 10.3(a), A.H.]

4. You noted in the application that FPL evaluated the economic, environmental and technologic feasibility of using reclaimed water as process water at the facility and found it to be infeasible due to the following reasons:
    - unreliability in water quantity and quality from the reclaimed source;
    - potential upsets at the plant (related to water quality);
    - high cost for additional treatment, and
    - potential for exceeding TMDLs in the discharge to the Indian River Lagoon.

    FPL submitted documentation, dated May 23, 2008, summarizing this analysis, and noted in the application that the District concurred. Have circumstances changed at the reclaimed facility in terms of reliability, quantity and quality since the time the evaluation was completed (2003; data from 2000 to 2003), that may allow use of this lower quality water source? Please evaluate the potential for using reclaimed water for landscape irrigation at the site. Since landscape irrigation is included in the project, please complete the Landscape Irrigation Type Use form (UL-1).

    District rule requires using the lowest acceptable quality water source, including reclaimed water for each consumptive use. In light of the fact that this is a new plant, the reclaimed pipeline is already constructed, and circumstances at the reclaimed plant may be more favorable for this use, it will be necessary to evaluate if it is economically, environmentally, or technologically feasible to use this source. [Paragraphs 10.3(e, f, g), A.H.; Rule 40C-2.101, F.A.C.]

5. Construction dewatering is described on p. 5-8. Please complete the applicable sections of the Dewatering Type Use form (DW-1). [Rule 40C-2.101, F.A.C.]

The District appreciates the Department's assistance in obtaining the above-requested information. If further clarification is needed regarding the District's requests, please contact me at (386) 312-2340. You may also contact Richard Burklew at (321) 676-6605 or Patricia Renish at (321) 984-4939 should you have any questions regarding the above.

Thank you in advance for your assistance.

Sincerely,

Mary Ellen Winkler
Assistant General Counsel
Office of General Counsel

MEW/mew

cc: Richard Burklew – Palm Bay
Patricia Renish – Palm Bay

FDEP RESPONSES

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS

FDEP-C a.i.1. RE: Environmental Resource Permit Wetlands: i. Dredging
Provide a spoil disposal detail, including, discharge details, locations retention plans, volumes, and data used to size the disposal cell(s). Include a description on the type of equipment that will be used to do the dredging (i.e. clamshell dredge or hydraulic dredge), and all (temporary and permanent) spoil disposal sites. Based upon the locations proposed for spoil disposal additional testing may be required.

RESPONSE: Comment acknowledged. If dredging is to be conducted, FPL will provide the spoil disposal detail, including discharge details, location retention plans, volumes, and data used to size the disposal cells to FDEP prior to commencing the dredging activity.

FDEP-C a.i.2. Pursuant to 18-21.011(3)(a) and 18-21.011(3)(c)1., F.A.C., payment for the removal of sovereign submerged land will be required at $2.25 per cubic yard, prior to issuance of the authorization. Do not provide payment until requested by department staff. Please note that a waiver of the severed dredge material payment may be requested and approved when: (a) the materials are being placed on public property and used for public purposed; or (b) it is affirmatively demonstrated that the severed dredge material has no economic value. If you choose to pursue a waiver using option (b) above, provide a certified engineer's report regarding the economic value. If you choose to pursue a waiver using option (b) above, provide a certified engineer's report regarding the economic value of the material to be dredged. The report must contain a sieve analysis indicating the percentage of material by grain size passing through a No. 200 sieve and must reflect that several samples were taken throughout the proposed dredge area. Refer to the enclosed package for specific requirements and information.

RESPONSE: Comment acknowledged.

FDEP-C a.ii.1. Florida Power and Light has requested a "perpetual" public easement for the peninsula of land that extends into the Indian River along the shoreline of the Cape Canaveral Plant. The Department's Title and Land Records Section is reviewing your application to determine if state-owned lands will be affected. If state-owned lands will be affected by your project, we will notify you in writing. Gloria Barber at (850) 245-2720 will handle the upland easement if required.

Public easements do not have an expiration date at this time; therefore a perpetual easement is not necessary.

RESPONSE: Comment acknowledged.

FDEP-C a.iii.1. The area under lease at the Cape Canaveral Plant is currently under review by the Department for an Environmental Resource Permit and Lease Modification to construct an additional boat slip adjacent to the existing facilities. In order to reduce processing fees for the applicant and streamline the process, it is recommended that the request for an extended term lease be filed in conjunction with the existing application, file number 05-290819-001.

The Department does not grant "perpetual" leases. There are instances, however, where extended term leases of 25 years may be granted. The applicant must specify in writing their request and reasons for an extended term lease in accordance with the guidance below.

RESPONSE: FPL requests that the modified sovereign submerged lands lease described in application file number 05-290819-001 be issued as an extended sovereign submerged lands lease of 25 years as part of this Site Certification Application. Pursuant to Rule 18-21.008(2)(a)(3), F.A.C., FPL needs an extended sovereign submerged lands lease to allow deliveries by barge to support the construction and operation of the converted power plant, which is a public benefit.

FDEP-C b.i.1. Please note that all existing ground water monitoring wells shall remain active and the quarterly ground water monitoring shall be carried out as per the ground water monitoring plan described in the current permit until all groundwater discharges cease and new plant is constructed and put in use by discharging all industrial waste streams in surface water as proposed. Please acknowledge.

RESPONSE: Comment acknowledged. FPL will continue to perform quarterly sampling at all five wells per the existing Groundwater Monitoring Plan contained in the current Industrial Wastewater Facility Permit No. FL0001473 until such time that all permitted wastewater discharges to groundwater cease.

FDEP-C b.i.2. Because the facility is granted the Water Quality Criteria Exemption of Secondary Drinking Water Standards by virtue of an existing installation, the Department proposes to continue groundwater monitoring for several Secondary Parameters (Total Dissolved Solids, Chloride, Sulfate, Aluminum, Manganese and Silver) on an annual basis in existing monitor wells after the new plant becomes operational. Please acknowledge.

RESPONSE: Comment acknowledged. FPL and FDEP will collaborate to reach an agreement on the specifics of a revised Groundwater Monitoring Plan.

FDEP-C b.i.3. The facility has been granted the Water Quality Criteria Exemption for the Primary Drinking Water Standard Sodium since September 28, 1994 and this Exemption will expire on August 9, 2010. Please be advised that even though the old plant will be demolished with elimination of groundwater discharges, the renewal of Exemption for Sodium parameter will still have to be pursued in time because of continued exceedances of this parameter above the Maximum Contaminant Level (MCL) in groundwater at several well locations and this Exemption will stand alone after new plant operations become effective. Please acknowledge.

RESPONSE: Comment acknowledged.

FDEP-C b.i.4. Primary Drinking Water Standard Antimony continues to be violated in groundwater at well location OB-5 above the MCL of 6 µg/L. Please continue to implement the actions the facility conveyed to the Department in the letter dated May 22, 2008 until a complete compliance is achieved in groundwater for this parameter at this well location. If the groundwater compliance is not achieved at this well location prior to the issuance of Site Certification for the construction of new plant, a Consent Order will have to be issued along with the Site Certification to address the antimony concerns in groundwater. The Consent

Order will require defining the extent of the groundwater plume and remedial measures with a time frame to achieve the groundwater compliance.

RESPONSE: Comment acknowledged. FPL is not aware of any legal or other basis to directly connect the final resolution of this existing Plant matter with the final certification of the Project, but FPL will continue to work with FDEP to address and resolve any issues related to antimony concentrations reported from monitoring well location OB-5.

FDEP-C b.ii. In accordance with Rule 40C-42.026(1)(c), F.A.C., demonstrate that the required water quality treatment volume will recover within 72 hours following a storm event assuming average antecedent moisture conditions. The storage volume must be provided by a decrease of stored water caused only by percolation through soil, evaporation or evapotranspiration. Include all site specific geotechnical information supporting the estimated seasonal high groundwater elevation and hydraulic conductivity values used in the recovery analysis. If this information was submitted previously, please direct the reviewer to the location where it can be found.

RESPONSE: FPL completed the analysis to demonstrate that the required water quality treatment volume will recover within 72 hours following a storm event assuming average antecedent moisture conditions. The analysis was provided to FDEP Central District on March 4, 2009 and is available to other agencies upon request.

FDEP-SCO 1. Describe how the conversion of the Cape Canaveral plant from the existing dual-fuel fired generation units to a conventional gas fired combined cycle plant will potentially lower carbon emissions.

RESPONSE: As presented in the SCA in Chapter 4.0 and in detail in Appendix 10.8, "Climate Change and FPL's Greenhouse Gas Strategy", conversion of the existing 1960s-vintage generating units at the Cape Canaveral Plant to a modern, highly efficient, lower-emission next-generation clean energy center using the latest combined cycle technology, with the use of natural gas as the primary fuel, will reduce carbon emissions as carbon dioxide (CO_2) in two ways. First, the maximum CO_2 emission rate with CCEC will be about one-half the maximum CO_2 emission rate of the existing Plant. By maximizing the megawatt output per unit of fuel consumed, the carbon emissions are minimized for each megawatt generated. Second, CCEC will be among the most efficient natural gas-fired generating units in FPL's system. As a result, CCEC will displace generation that would otherwise be produced by less efficient units in FPL's system, thereby reducing system CO_2 emissions. This is a significant reduction in carbon emissions from FPL's system as a direct result of the CCEC.

FDEP-SCO 2. To what extent has FPL evaluated the feasibility of processes to capture CO_2 from any of its plants in Florida? Provide any reviews conducted or plans to conduct assessments regarding the availability of deep confined geological strata within a reasonable distance (e.g. <200 kilometers) of the plant site for possible future CO_2 storage.

RESPONSE: Carbon capture and sequestration, often called CCS, involves collecting the CO_2 from power plant emissions and storing it underground. The technology to capture the CO_2 must be robust enough for large scale, commercial operation. FPL has participated in a strategic partnership with the University of South Florida in performing essential research to determine the geologic carbon

sequestration and enhanced oil recovery (EOR) potential in South Florida, specifically regarding the Sunniland Formation in southwest Florida. A pilot assessment of potential geologic sequestration is underway. Although CCS holds the potential for significant reductions in CO_2, its technical and commercial availability for use by the electrical generation industry is many years away and focuses primarily on CO_2 emissions from coal fired power plants. Further, many serious issues must be considered by federal and state government regarding liability of stored CO_2, mineral rights for storage areas, transportation of CO_2, etc. FPL does not expect CCS to reach commercial operative levels until after 2020 and to be cost prohibitive for state-of-the-art natural gas-fired combined cycle units, which will achieve very high efficiencies, with subsequently low CO_2 emissions rate.

FDEP-SCO 3. "Please submit summary information indicative of the outreach efforts which were extended to potentially affected persons in the vicinity of the power plant. Furthermore, the applicant should be advised that Governor Crist approved House Bill 7135 on June 25th. Accordingly, this Office requests that Progress Energy make a good faith effort to comply with the new Statutory requirements, including those below from 403.5115(6), F.S:

> ***(a) A good faith effort shall be made by the applicant to provide direct written notice of the filing of an application for certification by United States mail or hand delivery no later than 45 days after filing of the application to all local landowners whose property, as noted in the most recent local government tax records, and residences are located within the following distances of the proposed project:***
>
> > ***1. Three miles of the proposed main site boundaries of the proposed electrical power plant.***
> >
> > ***2. One-quarter mile for a transmission line corridor that only includes a transmission line as defined by s. 403.522(22).***
> >
> > ***3. One-quarter mile for all other linear associated facilities extending away from the main site boundary except for a transmission line corridor that includes a transmission line that operates below those defined by s. 403.522(22).***
>
> ***(b) No later than 60 days from the filing of an application for certification, the applicant shall file a list with the department's Siting Coordination Office of landowners and residences that were notified."***

RESPONSE: FPL provided direct written notice of the filing of the Site Certification Application by United States mail during the week of February 2, 2009, to 21,378 local landowners and residences located within 3 miles of the proposed main site boundaries of the proposed electrical power plant. On February 10, 2009, FPL submitted the Department's Siting Coordination Office a list of landowners and residences that were notified.

DCA RESPONSES

DEPARTMENT OF COMMUNITY AFFAIRS COMMENTS

DCA - 1. The applicant has stated that the City of Cocoa will be the source of potable and process water for the proposed power plant. In order to further evaluate this application, the Department of Community Affairs requests documentation such as a letter of agreement or contract with the City of Cocoa committing to provide the water supply in the amount required for the facility.

RESPONSE: Comment acknowledged. See attached letter from the City of Cocoa confirming water supply for the Project (see Attachment DCA-1).

ATTACHMENT DCA-1

City of Cocoa, Florida

Serving the Community

UTILITIES DEPARTMENT
600 School Street Cocoa, Florida 32922
PHONE (321) 639-7671 FAX (321) 639-7663
WEB SITE www.cocoafl.org

March 2, 2009

Mr. Richard Merrill, P.E.
Engineering Project Manager
Florida Power & Light Company
P.O. Box 14000 CPM/JB
Juno Beach, Florida 33408-0420

Re: Florida Power & Light Company Power Plant
6000 North U.S. 1
Cocoa, Florida 32927

Dear Mr. Merrill,

This letter is to confirm that there is sufficient potable water to service referenced site in the amount of 283,680 gallons per day average flow and 861,120 gallons per day peak flow. It is understood that the peak flow will be limited to 1,000 hours per year, there will on site storage for water, and the existing meter is not rated for the peak flow requirement and will need to be upsized. FPL will be responsible for the additional impact fees and cost associated with upsizing the meter.

If additional information is needed, please feel free to contact Mrs. Peggy Turner at 321-433-8799 or via email at pturner@cocoafl.org.

Sincerely,

Carl R. Larrabee, Jr., P.E.
Utilities Director

FWC RESPONSES

FLORIDA FISH AND WILDLIFE COMMENTS

FWC – A. Mitigation for any impacts to scrub jays (page 5-13) would be conducted through "The Brevard County Scrub Conservation and Development Plan (SCDP)." The document states that the SCDP is an approved Habitat Conservation Plan (HCP) for Brevard County. Our consultation with U.S. Fish and Wildlife Service staff indicates that Brevard County has not received approval for a Scrub Jay HCP, and unavoidable impacts to scrub jays would also require an incidental take permit from the FWC.

RESPONSE: Comment acknowledged. The Brevard County official website was used as the source of information regarding the Brevard County Scrub Conservation and Development Plan. Subsequent discussions with representatives of the USFWS indicated that the information presented on the Brevard County website was unclear. While the USFWS did provide some funding to the County in the 1990s for scrub jay surveys and habitat evaluations, the USFWS did not approve a Habitat Conservation Plan (HCP) for Brevard County. FPL will coordinate with the USFWS and FWC regarding appropriate measures to address impacts to scrub jay habitat.

FWC – B. Depending on review of the information requests following, the FWC may request additional wildlife surveys, to be conducted no longer than six months prior to initiating construction to determine if additional state-listed fish and wildlife species are present on the site. This list is found in Chapter 68A-27, Florida Administrative Code, which is available online at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.003 for Endangered species; at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.004 for Threatened species; and at http://www.flrules.org/gateway/RuleNo.asp?ID=68A-27.005 for Species of Special Concern.

RESPONSE: FPL has no reason to believe that 'additional state-listed fish and wildlife species are present on the site' beyond those addressed in the SCA. The comment appears to suggest that FWC may, based on new information, request additional wildlife surveys at a future date following a determination that the SCA is complete. FPL acknowledges the comment as such and would intend to consult with FFWCC staff in the event that new information indicated that additional wildlife surveys should be conducted.

FWC – C. If there is evidence that any individuals of these species are present, then the Licensee must report the findings to the FWC. If impacts to these species cannot be avoided, then the Licensee must contact the FWC before taking any action that might result in an impact to those species.

RESPONSE: Comment acknowledged.

FWC – D.a. Please provide the latitude/longitude for the St. Johns River Water Management District's water temperature station that was used to obtain the long-term data used in the modeling study.

RESPONSE: Station No. 27010875 is at latitude 28°-41′-13.049″, longitude 80°-48′-44.726″ on the Indian River.

FWC – D.b. Ambient water temperature data collected by the FWC during the winter of 1999 in the Indian River Lagoon at Titusville recorded a low temperature of 8.87°C on 1/5/1999. Also, during the 1989-90 manatee die-off event in Brevard, intake temperatures at the FPL and OUC plants dropped to 8°C (46°F). The FWC requests that FPL run the thermal discharge model again using the 8°C temperature to better reflect recorded lows for the Indian River Lagoon. After running the model with the lower ambient water temperatures, please provide similar graphics to those in the thermal study that represent the pertinent isotherms in the vicinity of the current and interim thermal discharges. In addition, the model was run at full load (100% plant capacity).

RESPONSE: FPL has run the thermal discharge model again, assuming an ambient water temperature of 46ºF. The resultant isotherms for the interim thermal discharge are shown in Figure FWC-Db-1. The resulting isotherms for the converted plant, under full load conditions, are presented as Figure FWC-Db-2.

There were two winter model runs in the SCA for conditions after the existing Plant is shut down. The first model run was for the converted Plant operating at full load with an ambient water temperature of 55ºF (see SCA Appendix 10.9, Section 2.1). The ambient water temperature of 55ºF was selected from the SJRWMD data (see SCA Appendix 10.9, Subsection 2.1.3). This model run was used primarily to compare the predicted thermal discharge during normal operation of the converted Plant with that of the existing Plant and to estimate the maximum size of the converted Plant's thermal plume. The second model run was for the interim refuge using electric heaters with an ambient water temperature of 36.7ºF (see SCA Appendix 10.9, Section 3.2). The ambient water temperature of 36.7ºF was determined by the model, using worst-case meteorological data from December 17, 1997 (see SCA Appendix 10.9, Subsections 2.2.3 and 3.2). The purpose of that model run was to demonstrate that the 30-million-Btu-per-hour heater system would provide enough heat to warm the desired area under worst-case conditions.

As shown on Figure FWC-Db-1, raising the ambient water temperature from the 36.7^{o}F that was modeled in the SCA to the 46°F requested by FWC, results in a much warmer refuge than was shown on Figure 10.9-10 of the SCA. FPL would not operate the refuge in such a manner; before the discharge temperature from the electrical heater system rises to the predicted 99.8^{o}F, the thermal output from the electrical heater system would be reduced to achieve the same isotherms that are shown on Figure 10.9-10 of the SCA.

As shown on Figure FWC-Db-2, when the ambient temperature is less than or equal to 46ºF, the discharge temperature is less than 62ºF under normal operating conditions [three Circulating Water (CW) pumps operating unthrottled]. However, when the ambient water temperature is unusually cold, FPL could increase the discharge temperature by reducing the CW flow rate (e.g., by turning off a CW pump and/or throttling the CW pumps). Sufficient flow reduction can be accomplished to increase the discharge temperature to be above 68ºF.

Based on further discussions with FWC on March 5, 2009, FWC will perform a post-completeness evaluation for any potential water quality issues associated with the temporary manatee heating system recirculation and provide guidance to FPL.

FWC – D.c. What is needed from the perspective of manatee conservation are model runs based on the minimum expected capacity of the repowered plant during winter. This would provide a range of realistic scenarios for the extent of the new plume.

RESPONSE: The minimum expected capacity will be when the converted Plant is not in operation (i.e., 0-percent capacity). Like the existing Plant, there is no heated effluent at 0-percent capacity factor. FPL will continue to comply with the Manatee Protection Plan from November 15 through March 31 as the existing Plant does. When the converted Plant is placed in-service it will be one of the most fuel-efficient plants in the FPL system and will operate at higher capacity factors than the existing Plant as a result of being in a higher economic dispatch position compared to the existing FPL Plant.

FWC – D.d. Additionally, we would also like a corresponding table of area of water above 68°F in relation to ambient temperatures ranging from 10°C to 20°C. The EQTP model used to simulate the thermal plume is based on cooling pond thermal dynamics and assumes that all heat loss is through the air-water interface (radiation, evaporation, conduction) and none through mixing or dilution with ambient waters.

RESPONSE: An ambient temperature of 10°C = 50°F; an ambient temperature of 20°C = 68°F. The table, in 2°F increments, follows.

Ambient Water Temperature °F (°C)	**Acres ≥ 68°F**
50 (10)	225*
52	306*
54	398*
56	504*
58	595
60	975
62	1,466
64	2,157
66	3,338
68 (20)	infinite
* Examples are based on reductions in flow rate to achieve a ΔT of 25°F.	

As reported in the SCA, without reducing flow and at an ambient water temperature of 55ºF, the area at or above 68ºF was estimated to be 10 acres.

Comment in second sentence is acknowledged. See response to Comment FWC – D.e.

FWC – D.e. Does this provide a realistic view of the hydrological conditions found in the Indian River at the Canaveral plant? Effects of mixing due to tides and currents have been observed in the dynamics of cooling water discharge fields (Davies et al. 1997).

RESPONSE: Yes, the EQTP model provides a realistic view of the hydrological conditions found in the Indian River at the Cape Canaveral Plant. Based on the plant outfall drawings, the discharge velocity was computed to be a relatively low 2.6 feet per second. Using GIS techniques, the discharge area of the Plant was identified on the nautical charts which show water depths, as well as

the quad sheets which also show some depths which are shallow. Based on this information, it is concluded that the discharge is essentially into shallow water, which allows no mixing from below and minimal mixing from the sides. Assuming that most of the heat transfer will be atmospheric (by evaporation, conduction, and radiation), the steady state energy balance model was deemed appropriate for modeling the thermal plume. In general, when thermal discharges show significant mixing with ambient water, it is due to the discharge being at high velocity. Tidal currents in the Indian River Lagoon are not significant in this vicinity.

FWC – D.f. Has the FPL model been tested (i.e., compared to empirical data) to confirm that the effect of water mixing due to currents and tides does not significantly affect the shape and volume of the warm water plume? If not, then FPL should ground truth model results in winter to check validity of assumptions with existing or new data. Volume and 3-D shape of the thermal plume may have important implications for manatee carrying capacity. The EQTP model developed by Golder Associates, Inc., is a good effort to understand variation in size of warm water refuge at Cape Canaveral plant after repowering and at the temporary thermal refuge; however, the water plume extension (at least the 68°F isotherm) should also be monitored through on-site measurements (water column temperature profiles and aerial thermal images). These observations would be very useful if conducted concurrently with studies of manatee behavior at the site.

RESPONSE: Yes, the model has been tested and confirmed that the effect of water mixing due to currents and tides does not significantly affect the shape and volume of the warm water plume at several other FPL plants, including Fort Myers and Lauderdale. The model was developed by Ebasco Services, Incorporated. The Ebasco model was utilized to determine estimated acreages of the thermal plumes; however, the shapes of the isotherms were based on the shapes of actual surveys that were done in the 1970s and reported in the original 316(a) document (ABI & Lyerly, Oct 1980). Therefore, the thermal plume shapes are based on empirical data.

FWC – E.a. Section 2.2 - Please provide additional detail regarding the temporary heating system that may be used (e.g., potential manufacturers) and a site plan showing proposed locations of the electrical heating units, intake, discharge locations and connecting pipelines.

RESPONSE: A conceptual design has been developed for the temporary heating system, and the site plan showing the proposed locations of the electrical heating units, intake, discharge, and connecting pipelines is presented in Figure FWC E.a-1. The final locations of the temporary heating system equipment will be determined during detailed design.

As shown on the conceptual site plan, water will be withdrawn from the eastern end of the intake canal via temporary intake pipes placed into the water, pumped through electric heaters, and then discharged into the western end of the intake canal. There will be multiple pumps and heaters installed which will allow for system operation under varying ambient conditions and the system will be designed to allow for additional heating to be added if required. A dedicated 13.2 -kV distribution feeder from FPL's electric system will provide the electrical power for the temporary heating system.

To prevent debris from entering the temporary heating system pumps, an inlet pipe debris filtration system will be installed. This may consist of a coarse-screen structure being placed in the water to prevent large debris from entering the system. The filtration system will be designed and installed to prevent high screen velocities that may impact manatees or other marine species.

Potential manufacturers of the temporary heating system equipment include Watlow (electric heaters) and Gormann-Rupp (pumps).

FWC – F.a. Section 5.1.1 - This section indicates that in-water construction will be required within the intake and discharge canals. Please describe what work in these areas is necessary and what type of on-water access may be needed (vessels, divers, timing of activities-day/night, etc.).

RESPONSE: Note: The correct reference to the SCA for this question is Subsection 5.4.1.2.

Potential work that may be required within the intake canal and discharge structure area will include:

Intake and Discharge Structure Maintenance/Refurbishment - The potential work may include repair/refurbishment and maintenance of the existing intake and discharge structures and equipment. Maintenance activities may include installation of stop logs and dewatering of the structures (as is currently done) and inspecting, cleaning, and repairing of concrete and steel structures, pumps, piping, debris filtration systems, etc. Repair and/or refurbishment of the discharge structure may require the installation of sheet piling, within 10 feet or less of the existing structure, to dewater area and allow for work to be performed on the outside of the structure that is normally submerged.

Seawall Refurbishment - The potential work may include ordinary repair/refurbishment/replacement of the existing seawall as required. The repair/refurbishment/replacement may include installation of new sheet piling within 1 foot of the existing seawall. There is not expected to be any work outside of what is typically required to repair existing seawall structures.

Temporary Manatee Heating System - The potential work may include installing temporary intake piping, debris filtration (e.g., fixed intake screens), and discharge piping in the intake canal area. On-water access to install the temporary piping may be required depending on the selection of the final intake and discharge locations.

It is not anticipated that on-water access would be required to perform the described maintenance work on the intake and discharge structures.

FPL will comply with the Manatee Construction Conditions for In-Water Work dated 2005, which are the current and appropriate construction conditions for use in all in-water work.

FWC – F.b. This section also indicates that maintenance dredging may be performed at the intake and barge canals. When will this activity be performed in reference to the deconstruction and construction phases of the repowering?

RESPONSE: The specific time period within the dismantlement and construction phases of the project during which the intake and barge channel dredging may be performed has not been determined. FPL has not determined that maintenance dredging will be performed; if required, FPL will comply with the Manatee Construction Conditions for In-Water Work dated 2005, which are the current and appropriate construction conditions for use in all in-water work.

FWC – F.c. Please provide site plans of the areas expected to be dredged and please indicate if any marine resources (seagrass, oysters, etc.) will be affected by the dredging.

RESPONSE: The site plans of the areas that may be dredged are shown in Figures FWC Fc-1 through Fc-3.

It is currently not known if any marine resources would be affected by the potential dredging. If dredging is required as part of the Project, a marine resources survey will be conducted prior to the commencement of dredging.

FWC – F.d. What type of dredge will be used (cutterhead, clam shell, hopper)?

RESPONSE: The type of dredge that may be used for maintenance dredging has not been determined. FPL historically has employed hydraulic dredging techniques to reduce turbidity impacts to the surrounding waters. If dredging is required as part of the Project, FPL will coordinate with appropriate agencies as to the type of dredging that will be used.

FWC – F.e. Will the spoil be placed on the barge peninsula per the nationwide permit? If so, how will the spoil be contained and when would the spoil be removed?

RESPONSE: As has been done in the past, it is anticipated that the spoil would be placed on the peninsula (or "mole" as referenced in Figure FWC Fc-3). The spoil material would be contained as shown in Figure FWC Fc-3. The spoil material would be removed from the peninsula prior to commercial operation of the converted Plant.

FWC – G.a. Section 5.2 - This section indicates that explosives will be used to dismantle existing plant facilities. Due to the proximity of these structures to the Indian River and the warm-water discharge that is used by the manatees, what precautions will be used to insure debris will not reach this area during explosive demolitions?

RESPONSE: Controlled explosive demolition techniques, if used to dismantle the existing Plant, would be performed on structures that are sufficiently far enough away from the adjacent waters to preclude any material from reaching those waters. Additionally, controlled explosive demolition would only be performed by demolition contractors that are highly experienced in these types of demolition techniques using an FPL-approved blasting plan that would ensure that the appropriate controls are in place to prevent demolition debris from entering any adjacent waters.

FWC – H.a. Section 5.4.2.2 - The Manatee Construction Conditions for In-Water Work dated 2005 are the current and appropriate construction conditions to use for all in-water work.

RESPONSE: Comment acknowledged.

FWC – I.a. Section 6.2.3 - Is FPL-Canaveral collecting ambient and discharge water temperatures?

RESPONSE: Yes.

FWC – I.b. If so, how often are these temperatures collected and at what locations are they collected?

RESPONSE: Cape Canaveral Plant monitors intake and discharge water temperatures on a continuous basis while the circulating water pumps are in operation. The ambient Indian River Lagoon water temperatures are measured from probes located just prior to the power plant condensers and the discharge temperatures are measured from probes located just after the power plant condensers.

FWC – I.c. Because the plant modifications would result in a 25% reduction of flow from the thermal discharge, FWC believes water temperature monitoring should be conducted in the vicinity of the thermal discharge to document pre- and post-construction temperature regimes.

RESPONSE: Potential future monitoring is properly dealt with in the Conditions of Certification. FPL will be glad to discuss the substance of such conditions with all the appropriate agencies during the time period between when the SCA is deemed complete and when agencies are required to submit reports to FDEP.

FWC – J.a. Appendix 10.2.1, Form 2CS Attachment B-2 - Please verify, as generally stated in this appendix, that no modifications to the intake and discharge structures, screens or intake and discharge pipes are planned.

RESPONSE: There are no planned modifications to the existing intake and discharge structures, screens, or intake and discharge pipes water-ward of the intake and discharge structures for the converted Plant. As stated in Section 5.4 of the SCA, maintenance, repair, and refurbishment of the existing intake and discharge structures will be conducted.

FWC – J.b. Please provide site plans and cut-sheets for any new or modified structures and discharge or intake pipes.

RESPONSE: There are no planned modifications to the existing intake and discharge structures, screens, or intake and discharge pipes water-ward of the intake and discharge structures.

FWC – K.a.i. Did FPL do any 3-D modeling of the interim refuge plume?

RESPONSE: FPL has not done any 3-D modeling of the interim refuge plume. FPL expects that locating the discharge near the bottom of the channel, and the intake at various levels, will result in the enclosed part of the intake canal being homogeneous with respect to temperature.

FWC – K.a.ii. Do they expect the entire water body within the enclosed part of the intake canal to be relatively homogeneous in temperature? Or will there be temperature stratification, such that only certain depths will provide sufficient temperatures for manatee thermoregulation?

RESPONSE: FPL expects that locating the discharge near the bottom of the channel and the intake at various levels, will result in the enclosed part of the intake canal being homogeneous with respect to temperature.

FWC – K.a.iii. The FWC believes it is important for FPL to test the ability of the new unit to create an effective thermal refuge during winter 2009-10, because that provides time to monitor the plume, identify problems or deficiencies, and modify the system before the main plant goes offline. This test would include measuring and monitoring the thermal plume under a range of ambient temperatures to truth and refine the model. Such monitoring should continue into the three winters of the shutdown.

RESPONSE: FPL agrees it is important to test and validate that the temporary Manatee heating system will perform as designed prior to the 2010-2011 winter. Continued operation of the existing Plant during the 2009-2010 winter would make early installation and operation of the temporary heating system impractical for a number of reasons including the inappropriate heating of the intake cooling water. However, FPL believes that a performance test of the temporary system performed in any season will allow us to accurately establish how the system will perform during the winter. FPL will construct, test, and tune the temporary heating system prior to the 2010-2011 winter, and will monitor the system's performance during the three winters it will be in operation.

It is expected that the temporary heating system will be installed and ready for startup and testing in the late summer/early fall of 2010. This will allow for sufficient time to verify and test the design and operation of the system prior to the time the system would be needed. Additionally, it will allow sufficient time to modify/alter the design or operation of the temporary heating system, if required, prior to the 2010-2011 winter.

FWC – K.a.iv. How quickly can FPL warm the interim thermal refuge to equilibrium state from a cold start?

RESPONSE: FPL has performed an estimate of how long it will take to bring a volume of water in the refuge equivalent to 2.05 acres up to a temperature of at least 68°F, assuming the 30-million-Btu-per-hour heater system is turned on when the ambient temperature drops to 60°F. The estimated time is 33 hours. At that time, the heater system can be throttled back to about 7.4 million Btus per hour to hold that temperature pattern if meteorological conditions hold.

The time to warm the interim thermal refuge will be verified during the design verification and startup testing that will be performed in late summer/early fall of 2010.

FWC – K.a.v. If a matter of days, how will it be determined whether the ambient water temperature will be expected to drop below the trigger temperature?

RESPONSE: In practice, FPL will most likely start the heater system at a higher trigger temperature in anticipation of the cold water event. The actual trigger temperature will be determined from physical testing of the system after it is installed.

FWC – K.a.vi. Manatees could suffer if there are extended periods of cool weather that only moderately exceeds the 61°F threshold. FPL will need to consider weather forecasts and work with the FWC and U.S. Fish and Wildlife Service (USFWS) managers to provide warm water if needed to avoid manatee morbidity and mortality.

RESPONSE: Comment acknowledged.

FWC – K.b.i. Manatee monitoring plans will be required in this permit with specific requirements to be agreed upon by FWC, USFWS, and the Florida Department of Environmental Protection. Monitoring plans need to include the time frame beginning one year in advance of construction, during the construction phase and post construction. Monitoring efforts shall include aspects of manatee behavior and distribution during the repowering effort. Manipulation of the interim warm-water refuge as part of the monitoring plan should be discussed by FPL, USFWS, and FWC as a technique to enhance our understanding of manatee response to the loss of industrial warm-water habitat.

RESPONSE: Comment acknowledged.

FWC – K.b.ii. Long-Term Plan - Post-construction, and within an agreed upon timeframe, the FWC, USFWS, and FPL will need to develop a plan to minimize adverse affects to manatees that provides for the weaning of manatees from the repowered FPL-Canaveral warm-water discharge and/or establishing an alternative warm-water resource area prior to the plant significantly reducing operations or permanently being retired.

RESPONSE: Comment acknowledged.

FWC – K.c.i. Has FPL conducted any marine resource monitoring (seagrass, oyster, fishery, etc.) in the vicinity of the Canaveral facility to determine the affects of the plant's intake and thermal discharge on the Indian River Lagoon's natural resources? If so, please provide the FWC any reports or information associated with these monitoring programs.

RESPONSE: Comprehensive studies of the marine resources in the vicinity of the Canaveral facility were conducted by Applied Biology, Inc. and Ray Lyerly & Associates for FPL in 1978 and 1979 (as indicated in SCA Appendix 10.2). An electronic copy of these studies was provided to FFWCC on March 5, 2009, and is available to other agencies upon request.

In addition, an Impingement Mortality and Entrainment Characterization Study (IMECS) is underway for the Cape Canaveral Plant but has not been completed. FPL will submit a report containing the results of the IMECS to the FDEP in connection with the renewal of the Industrial Wastewater Facility (IWWF) permit to support FDEP's Best Professional Judgment Determination of Best Technology Available. The IWWF permit renewal application is scheduled for submittal to FDEP 6 months prior to permit expiration (the current permit expires August 9, 2010).

FWC – K.c.ii. Has FPL provided compensatory mitigation for any marine resource impacts from the construction or operation of the original Canaveral facility?

RESPONSE: No, FPL has not provided compensatory mitigation for marine resources impacts for construction or operation of the existing Plant. The existing Plant was built in the early 1960s. Thus, construction of the Plant precedes any regulations that might require compensatory mitigation for marine resources. The existing Plant's operation has been permitted by FDEP and the U.S. Environmental Protection Agency (EPA) since the 1970s without any compensatory mitigation for marine resources.

FWC – K.c.iii. Has FPL planned any marine habitat monitoring post construction to determine the affects of the reduced thermal discharge will have on marine resources such as seagrass?

RESPONSE: FPL has not planned any marine habitat monitoring post construction because it is not anticipated that the reduced thermal discharge will have adverse impacts on marine resources.



LEGEND

Enclosed Temperature (degrees F)

- 86
- 88
- 90
- 92
- 94
- 96
- 98

- Discharge
- Intake
- Alternate Intake

NOTES

REFERENCE

1. Imagery, ESRI_Imagery_World_2D.lyr

0 125 250 500 Feet

SCALE AS SHOWN

PROJECT

FPL
CAPE CANAVERAL ENERGY CENTER

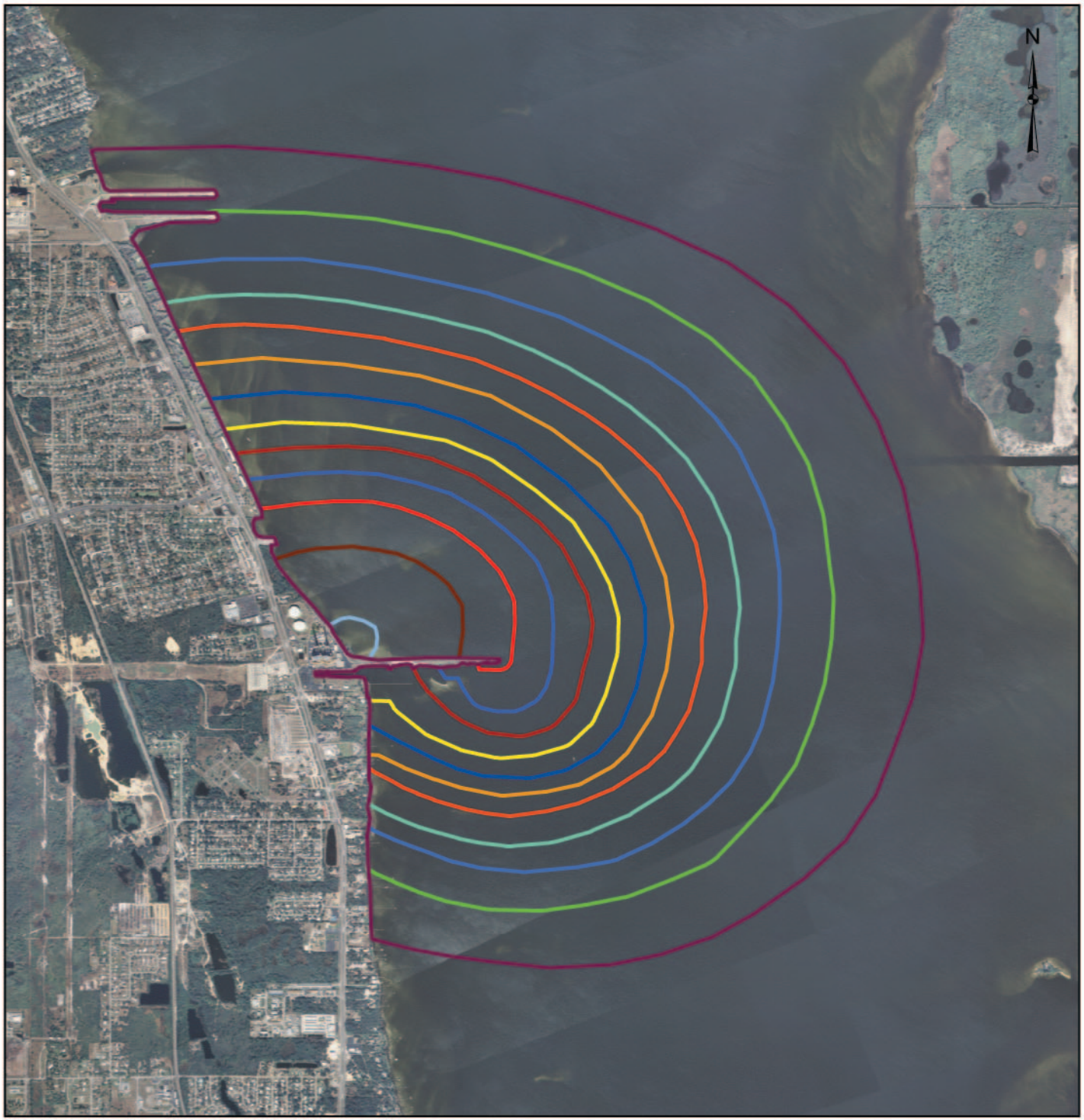
TITLE

Manatee Thermal Refuge (30 MBtu/hour) Temperature Contours

PROJECT No. 083-87633			File No.	REV. 0
DESIGN	KK	03/02/2009	FIGURE FWC-Db-1	
GIS	KK	03/02/2009		
CHECK				
REVIEW				

FPL

G:\GIS\FPL\083877556\PROJECTS\AC_REPORT\FIGURE_FWC_Db-1.mxd



LEGEND

Enclosed Temperature (degrees F)

- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59

NOTES

Ambient Water Temperature = 46.0° F

REFERENCE

1. Imagery, ESRI_Imagery_World_2D.lyr

0 1,000 2,000 4,000 Feet

SCALE AS SHOWN

PROJECT

FPL

CAPE CANAVERAL ENERGY CENTER

TITLE

Case 3 Isotherms

(Converted Plant Full Load Wintertime)

	PROJECT No. 083-87633		File No.	REV. 0
	DESIGN	KK	10/07/2008	FIGURE
	GIS	KK	10/07/2008	
	CHECK			FWC Db-2
	REVIEW			

FPL

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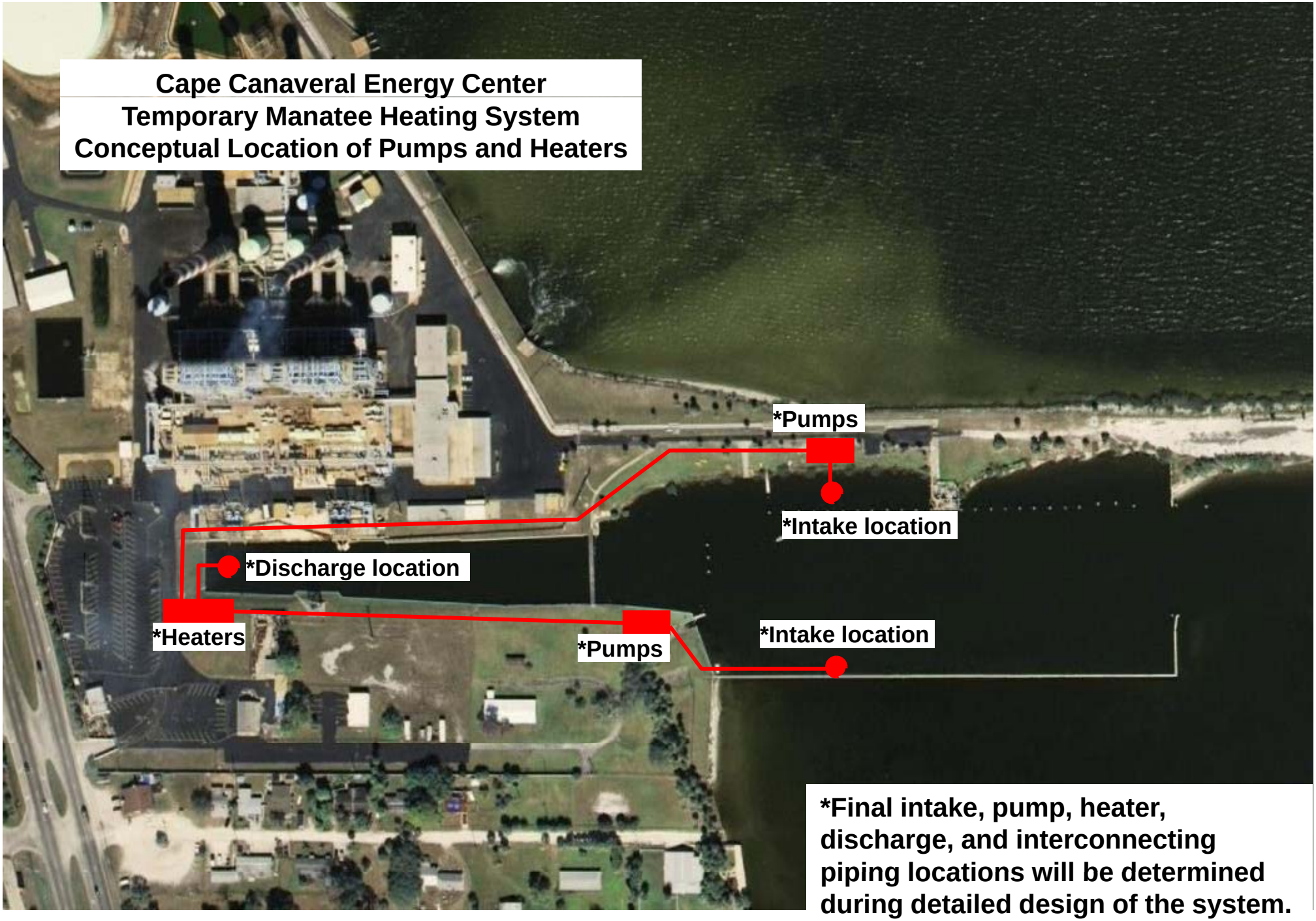
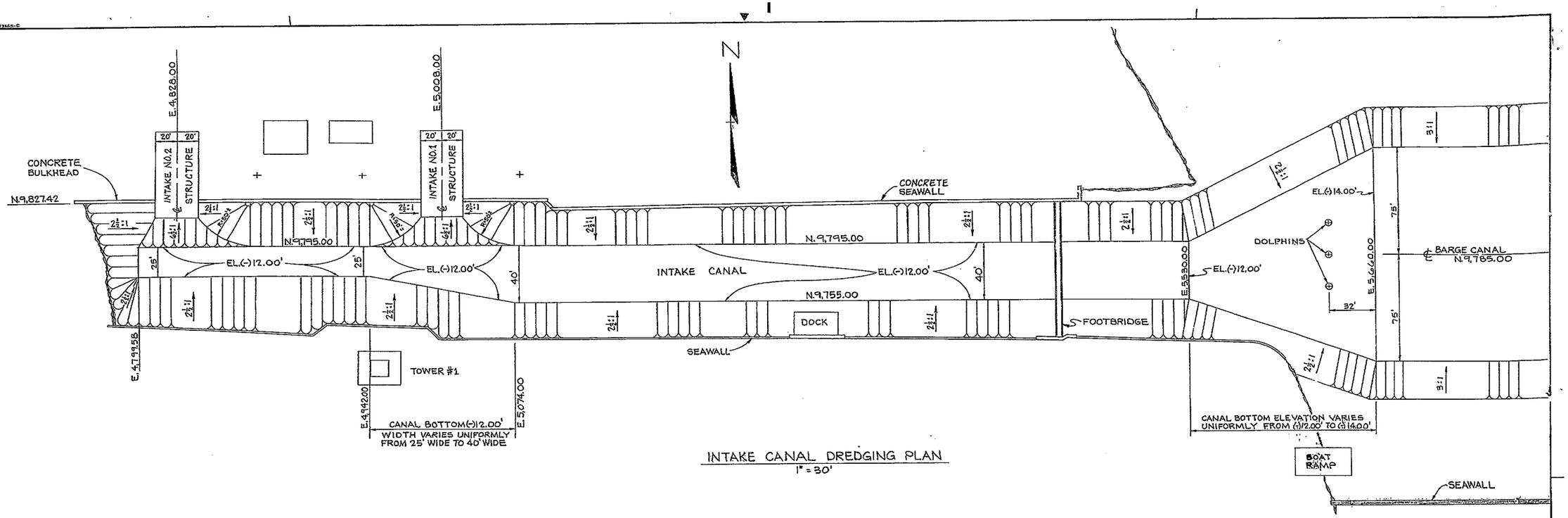


Figure FWC Ea-1



INTAKE CANAL DREDGING PLAN
1" = 30'

NOTES:

1. ELEVATIONS SHOWN ARE BASED ON M.L.W. DATUM = 0.00'. ELEVATION 0.00' IS MEAN LOW WATER IN THE INTRACOASTAL WATERWAY BETWEEN COCOA AND TITUSVILLE, WHICH IS 0.10' BELOW MEAN SEA LEVEL.

2. MAINTENANCE DREDGING MAY BE PERFORMED IN TWO PHASES. PHASE 1 MAINTENANCE DREDGING COMPRISES APPROXIMATELY 1,825 LINEAL FEET OF F.P.L.'S INTAKE AND BARGE CANALS EXTENDING FROM THE WESTERNMOST END OF THE INTAKE CANAL TO GRID LINE E.6,600.00. PHASE 2 MAINTENANCE DREDGING COMPRISES 1,968 LINEAL FEET OF F.P.L.'S BARGE CANAL FROM GRID LINE E.6,600.00 TO THE INTRACOASTAL WATERWAY, GRID LINE E.8,568.00.

3. UNITS #1 & #2 REQUIRE 275,000 GALLONS/MINUTE (PER UNIT) OF INTAKE COOLING WATER WHEN FULLY OPERATING.

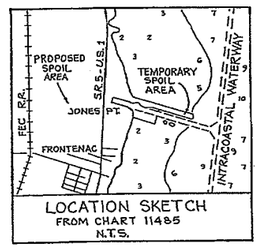
4. FINAL DREDGING PROFILES SHALL BE IN STRICT ACCORDANCE WITH DRAWINGS. OVER-EXCAVATION ADJACENT EXISTING SEAWALLS, MOORING DOLPHINS, CHANNEL MARKERS, AND THE FUEL OIL UNLOADING DOCK IS CONSIDERED UNACCEPTABLE. THE CONTRACTOR SHALL BE REQUIRED TO BACKFILL ALL SUCH OVER-EXCAVATED AREAS TO THE PROFILES SHOWN ON CONTRACT DRAWINGS. THE CONTRACTOR SHALL ALSO BE REQUIRED TO INSURE THE STABILITY OF THE NOTED STRUCTURES UNTIL SUCH BACKFILLING CAN BE COMPLETED.

5. DREDGING OPERATIONS SHALL NOT INTERFERE WITH CONTINUOUS OPERATION OF THE CAPE CANAVERAL PLANT.

6. SPOIL MATERIAL MAY BE TEMPORARILY PLACED ON THE EXISTING MOLE FOR PURPOSES OF DECANTING.

7. DECANTING/DREDGING OPERATIONS SHALL BE CONTROLLED SUCH THAT DISCHARGE INTO SURROUNDING WATERS DOES NOT INCREASE THE TURBIDITY OF THE RECEIVING WATERS BY MORE THAN 50 JACKSON UNITS ABOVE EXISTING TUBIDITY LEVELS.

8. THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE F.P.L. PROPERTY, ESPECIALLY TREES, IN THE AREA ADJACENT TO THE JOB SITE AND AT PERMANENT AND TEMPORARY SPOIL SITES, AND SHALL CLEAN-UP AND RESTORE ALL PROPERTY TO ITS ORIGINAL CONDITION.



LOCATION SKETCH
FROM CHART 11485
N.T.S.

REFERENCE DRAWINGS

BECHTEL DRAWING NO. 4905-C-7-G; "EXCAVATION PLAN AREA 3"
BECHTEL DRAWING NO. 4905-C-10-G; "ROADS, WALKWAYS, FENCING, & LANDSCAPING AREA 3"

Figure FWC Fc-1

AUTH	NO.	DATE	REVISION	BY	CH	COR	APP

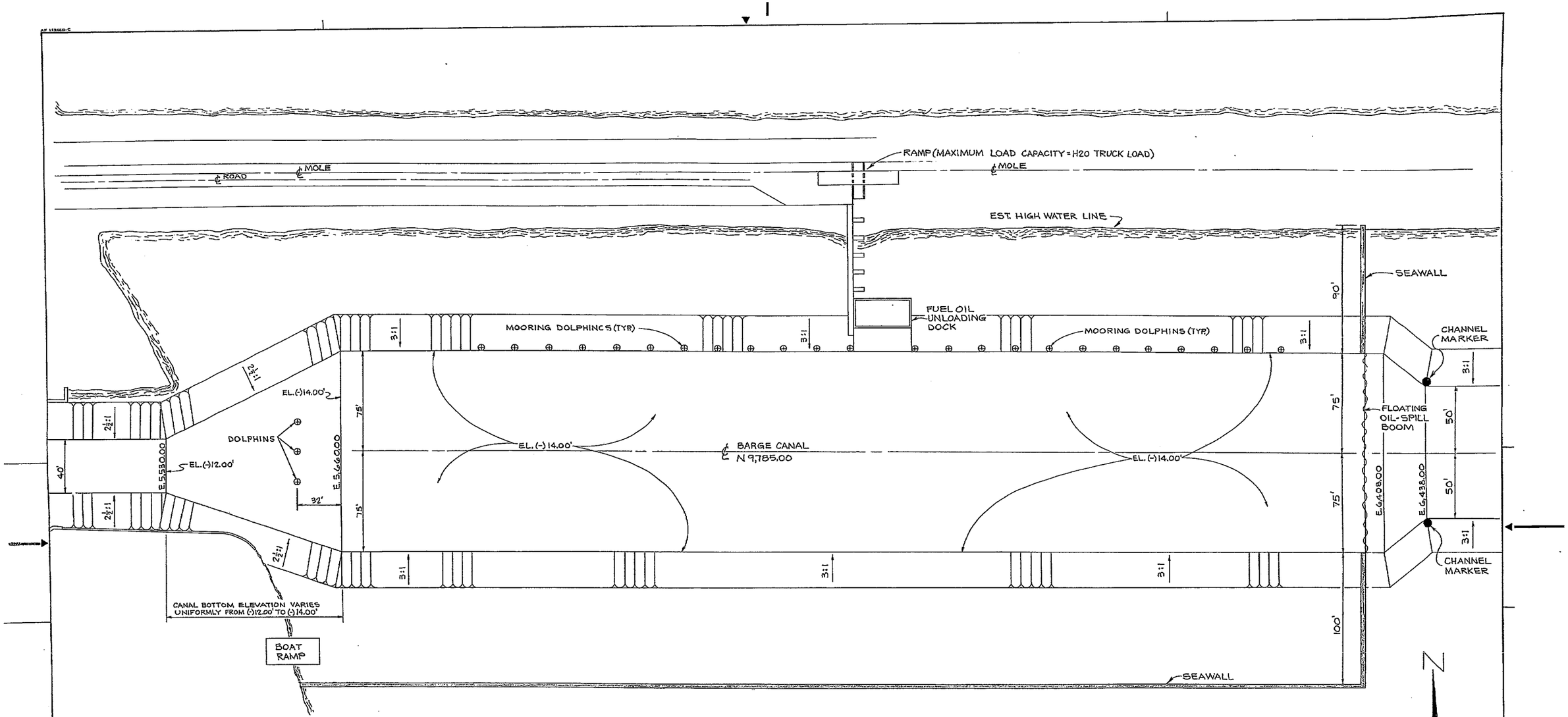
DATE 10-8-80 | SCALE 0 30 60 90

FPL FLORIDA POWER & LIGHT COMPANY

DR D. Smith | ER NO.
CH [signature] | COR
APPROVED [signature]

CAPE CANAVERAL PLANT
INTAKE AND BARGE CANALS
MAINTENANCE DREDGING

(CEB.C.-)
Sheet 1 of 3
913-E-80626
REV. NO.



BARGE CANAL DREDGING PLAN
1" = 30'

REFERENCE DRAWINGS

BECHTEL DRAWING NO. 4058-C-19-G; "BARGE CANAL EXCAVATION & MOLE EMBANKMENT"
BECHTEL DRAWING NO. 4058-C-109-G; "FUEL OIL UNLOADING DOCK, GENERAL PLAN, SECTION AND DOLPHIN DETAILS"
FPL DRAWING NO. E-73382; "HORIZONTAL & VERTICAL CONTROL DATA, CAPE CANAVERAL PLANT"

Figure FWC Fc-2

AUTH	NO.	DATE	REVISION	BY	CH	COR	APP

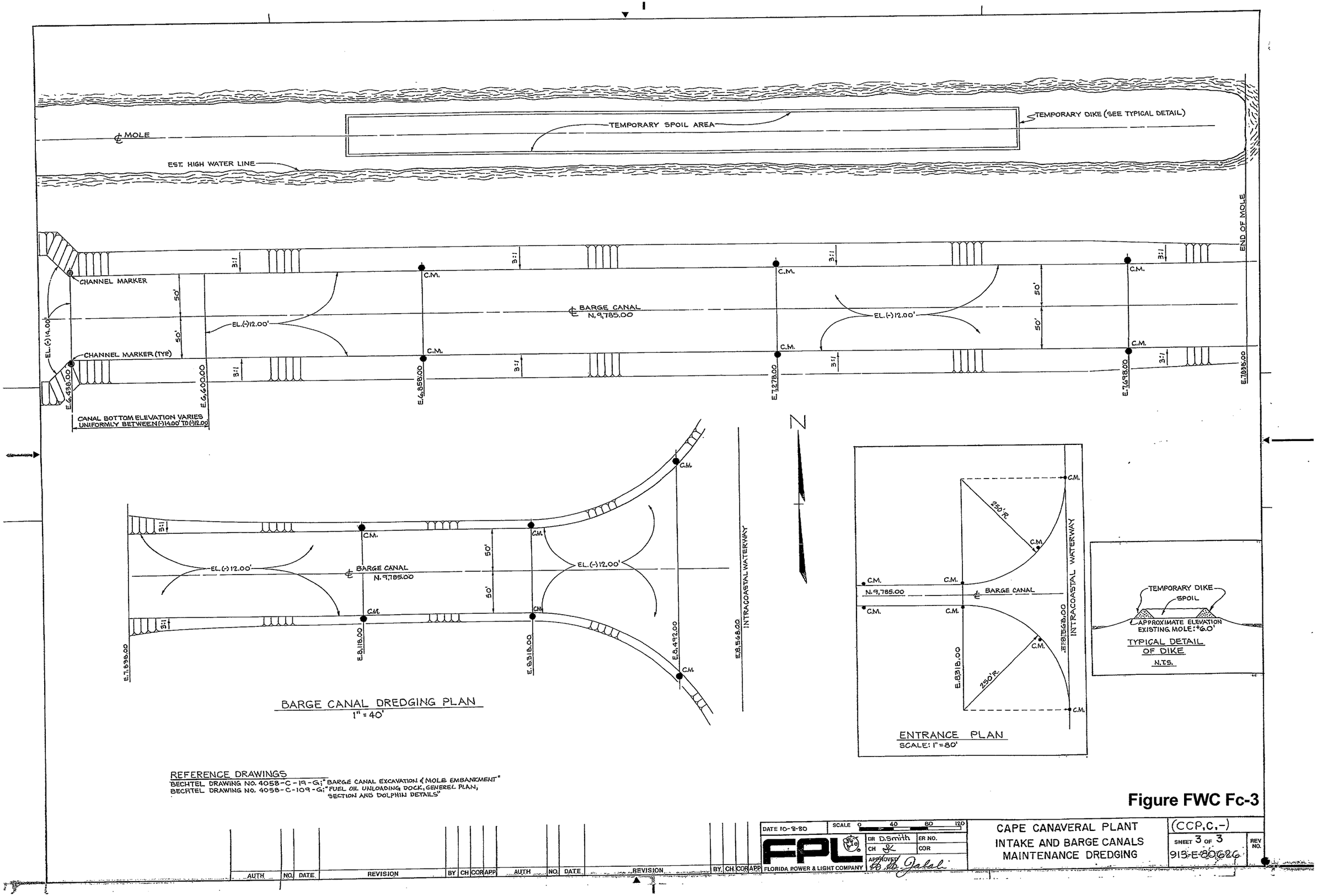
DATE 10-8-80 | SCALE 0 30 60 90

FPL FLORIDA POWER & LIGHT COMPANY

DR D.Smith | ER NO.
CH | COR
APPROVED

CAPE CANAVERAL PLANT
INTAKE AND BARGE CANALS
MAINTENANCE DREDGING

(CCP,C,-)
Sheet 2 of 3
913-E-80626
REV. NO.



REFERENCE DRAWINGS
BECHTEL DRAWING NO. 4058-C-19-G; "BARGE CANAL EXCAVATION & MOLE EMBANKMENT"
BECHTEL DRAWING NO. 4058-C-109-G; "FUEL OIL UNLOADING DOCK, GENERAL PLAN, SECTION AND DOLPHIN DETAILS"

Figure FWC Fc-3

AUTH	NO.	DATE	REVISION	BY	CH	COR	APP

DATE 10-8-80 | SCALE 0 40 80 120

FPL FLORIDA POWER & LIGHT COMPANY

DR D.Smith | ER NO.
CH | COR
APPROVED

CAPE CANAVERAL PLANT
INTAKE AND BARGE CANALS
MAINTENANCE DREDGING

(CCP,C,-)
SHEET 3 OF 3
913-E-80626
REV NO.

SJRWMD RESPONSES

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT COMMENTS

SJRWMD - A. Please provide the detailed engineering calculations that were used to determine the cooling and process water usage in the new plant and/or provide calculations and operational data from a similar plant. [Paragraphs 10.3 (a,b), Applicant's Handbook: Consumptive Uses of Water (August 12, 2008), hereinafter A.H.]

RESPONSE: The cooling and process water usages are based on the equipment used in the design of FPL's West County Energy Center (WCEC), which has been approved through the Power Plant Siting Act process and is currently under construction in Palm Beach County, Florida.

The average daily water usages are based on a 75°F ambient air temperature, 59 percent relative humidity, evaporative coolers in service, natural gas fuel, and heat recovery steam generator (HRSG) duct burners not in service. The revised water balance for CCEC is shown in Attachment SJRWMD-A as Figure 4.5.0-1 (Revised).

The estimated average daily process water uses are as follows:

Estimated Average Daily Process Water Use	Basis	Usage (gpm)
Steam Cycle Makeup	West County Energy Center equipment design	71
Evaporative Cooler Makeup	West County Energy Center equipment design	54
RO Reject	25 percent reject of total makeup water to reverse osmosis (RO) process	41
Multimedia Filter Backwash	2 percent of total makeup to water treatment plant	4
Service Water	West County Energy Center equipment design	25
Total Required Water Treatment Supply Flow Rate		195
HRSG Blowdown Recovery		35
Total City of Cocoa Potable Water Requirement		160

Water Treatment Supply Water – Potable water from the City of Cocoa and recovered HRSG blowdown water is used as makeup to the water treatment plant to produce demineralized water for use in the HRSGs, and for service water use throughout the plant. Approximately 25 percent of the demineralizer supply water is rejected from the RO process used to produce the demineralized water. The estimated potable water makeup flow is 160 gpm, the estimated recovered HRSG blowdown flow is 35 gpm, and 45 gpm is rejected from the water treatment plant.

Steam cycle makeup – This is estimated to be 2 percent of the total steam flow to the steam turbine, which is 71 gpm of makeup water. This makeup is used mostly as heat recovery steam generator (HRSG) blowdown to control steam cycle water chemistry. Approximately 35 gpm of the HRSG blowdown is recovered and reused as makeup to the water treatment system.

Evaporative cooler makeup – The estimated makeup to the evaporative coolers for combustion turbine inlet air cooling is 27,000 lb/hr, or 54 gpm. Approximately 1 gpm of this makeup is used as

blowdown to control the water chemistry of the sumps within the evaporative coolers and is rejected to the Plant/Equipment Drains flow.

Plant/Equipment Drains – This flow is estimated to be 25 gpm based on the WCEC design and the main use is for plant service water (e.g., washdown hose connections throughout the plant for plant maintenance).

The estimated average cooling water uses are as follows:

Cooling Water Flow – The cooling water is used 1) in the circulating water system to condense the steam exiting the steam turbine and entering the condenser, and 2) in the auxiliary cooling water system to cool the closed equipment cooling water system. The estimated cooling water flow rates are 412,500 gpm for the circulating water system and 16,300 gpm for the auxiliary cooling water system.

Cooling Water Pump Seals – This flow is based on the capacity of the existing Lube Water Pumps which have a design capacity of 44 gpm each. There will be two Lube Water Pumps in service for a total flow of 88 gpm.

Screen Wash Pumps - This flow is based on the capacity of the existing Screen Wash Pumps which have a design capacity of 600 gpm each. There will be two Screen Wash Pumps in service for a total flow of 1,200 gpm.

The estimates for the peak process water uses are as follows:

Estimated Peak Water Use	**Basis**	**Usage (gpm)**
Combustion Turbine Water Injection	West County Energy Center equipment design	370
Steam Cycle Make-up	West County Energy Center equipment design	51
RO Reject	25 percent reject of total makeup water to RO process	140
Multimedia Filter Backwash	2 percent of total makeup to water treatment plant	12
Service Water	West County Energy Center equipment design	25
Total Required Water Treatment Supply Flow Rate	102°F/50 percent RH, evap coolers off, ultra low-sulfur light oil, unfired	598

Water Treatment Supply Water – The estimated peak use is based operation of the plant on ultra low-sulfur light oil, which requires water injection into the combustion turbines to control emissions, and the evaporative coolers and HRSG duct burners out of service.

Water Treatment Reject – The estimated peak reject flow rate is based on the above table, 140 gpm for RO Reject plus 12 gpm for multimedia filter backwash.

Peak Demineralized/Service Water Flow to Combined Cycle Unit – The estimated peak flow of 446 gpm is based on the above table, 370 gpm for combustion turbine water injection, 51 gpm for steam cycle makeup, and 25 gpm for service water use.

Peak Evaporation Flow Rate – The estimated peak flow of 395 gpm is based on the above table, 370 gpm for combustion turbine water injection, plus 25 gpm of steam cycle makeup evaporation.

Peak HRSG Blowdown Flow – The estimated peak flow of 46 gpm is based on the maximum estimated HP steam flow and reflects unit operating conditions at 95°F ambient air temperature, 49 percent relative humidity, evaporative coolers in service, natural gas fuel, and HRSG duct burners in service.

Peak Plant/Equipment Drains Flow – Peak flow of 29 gpm is based on service water usage of 25 gpm and a peak evaporative cooler blowdown flow of 4 gpm.

SJRWMD – B1. On page 6-4, Impacts on Water Supplies, Groundwater, the application states that cooling water for the pump seals will continue to be withdrawn from the surficial aquifer through pumps located within the intake structure. It is noted elsewhere in the application that the source of this water is the Indian River Lagoon. You indicated in our meeting on January 27, 2009, that there are at least two surficial aquifer wells adjacent to the intake structure that are the source of this water. The District's database does not include these surficial aquifer wells. Please provide details on the wells (diameter, depth location, etc.) and usage.

RESPONSE: There are three existing Upper Floridan aquifer wells that are located adjacent to the Units 1 & 2 intake structures. The two wells located adjacent to the Unit 1 intake structure (28.4683°N, 80.7639°W) were installed during the construction of Unit 1 between 1964 and 1966. FPL has no documentation regarding the diameter or depth of these wells. The well located adjacent to the Unit 2 intake structure (28.4683°N, 80.7642°W) was installed during the construction of Unit 2 between 1967 and 1969. Based on well test data dated August 11, 1969 (see Figure SJRWM-B1), the diameter of this well is 6 inches and was drilled to a depth of 215 feet. The third well is cased to 193 feet.

The water from these pumps is used as circulating water pump bearing lubrication and cooling water. The historical water usage from these wells has been reported in the bi-annual EN-50 Water Use Reports submitted to SJRWMD. The Station IDs for these wells are 26970 for the Unit 1 wells and 26971 for the Unit 2 well.

SJRWMD – B2. Please evaluate utilizing Indian River Lagoon water for this use.

RESPONSE: Comment acknowledged. FPL will further evaluate Indian River Lagoon water for this service during the detailed design of the converted Plant and determine if it is technically and economically feasible for this use. The water quality requirements for cooling water pump seal water dictate that the water used be clean and free of debris and solids as the pump shaft bearing clearances can be as low as 0.010 inch. Any solids in the seal water that enter into the pump bearings can cause catastrophic pump damage. Additionally, the seal water must be turned on to the pump at least 15 minutes prior to and after the pump is started up or shut down, which requires an external source of pump seal water. For these reasons, well water has typically been used in circulating water pump bearing cooling water service, with potable water serving as a backup source.

SJRWMD – B3. It is also noted in this section that all surficial aquifer wells will be abandoned. Please clarify the reference to groundwater and the surficial aquifer in this section.

RESPONSE: The first paragraph of Subsection 6.3.2 in the SCA discusses water for the pump seals that will continue to be withdrawn from the surficial aquifer through pumps located within the intake structure. This reference to the surficial aquifer was an error. Further investigation by FPL following the meeting with FPL and SJRWMD staff on January 27, 2009, indicates that these wells and pumps are not withdrawing from the surficial aquifer; rather they are likely withdrawing from the Upper Floridan aquifer (see response to comment SJRWMD B1). The last paragraph of Section 6.3.2 in the SCA discusses the existing surficial aquifer wells located on FPL property west of U.S. Highway 1 (at the construction parking and laydown area) that will be abandoned (see response to comment SJRWMD B4).

SJRWMD – B4. Please provide an abandonment schedule for these wells.

RESPONSE: As shown in Table 3.3.3-1 and Figure 3.3.3-1 of the SCA, the existing FPL Cape Canaveral Plant has 12 inactive and 12 active surficial aquifer wells located on FPL property west of U.S. Highway 1 (at the construction parking and laydown area). These wells will not be used for operation of CCEC. Therefore, these wells will be abandoned and plugged by a licensed water well contractor, following procedures and requirements of Chapter 40C-3, F.A.C. FPL will have the water well contractor submit the well completion reports, as required by Chapter 40C-3.411. All the inactive wells and 10 of the active wells will be abandoned and plugged sometime during demolition of the existing facilities spring 2010 to spring 2011. The two remaining active wells may be used during construction for activities such as dust control and equipment washing, but they will not be used for potable water supply. The use rate during construction of CCEC will be much less than the current permitted authorization. FPL will continue to report the quantity of water withdrawn as required by the existing Consumptive Use Permit. After the converted Plant is operational in June 2013, the two remaining surficial aquifer wells will be abandoned and plugged following the procedures discussed above.

SJRWMD – C. On pages 6-4 and 6-5, Impacts on Water Supplies, Drinking Water, the application states that average annual municipal water demand will increase by approximately 15 percent to 283,680 gpd (103.5 mgy). Is this due to increased use in the heat recovery steam generators (HRSGs) and/or irrigation usages? [Paragraph 10.3(a), A.H.]

RESPONSE: As shown on the revised water balance [see Figure 4.5.0-1 (Revised) in response to comment SJRWMD-A], the average annual water usage for the converted Plant is 230,400 gpd, which is similar to the existing Plant usage. The water uses for converted Plant operation and irrigation will be similar to the existing Plant operation and landscape use.

SJRWMD – D1. You noted in the application that FPL evaluated the economic, environmental and technologic feasibility of using reclaimed water as process water at the facility and found it to be infeasible due to the following reasons:

- **unrealiability in water quantity and quality from the reclaimed source;**
- **potential upsets at the plant (related to water quality);**
- **high cost for additional treatment; and**
- **potential for exceeding TMDLs in the discharge to the Indian River Lagoon.**

FPL submitted documentation, dated May 23, 2008, summarizing this analysis, and noted in the application that the District concurred. Have circumstances changed at the reclaimed facility in terms of reliability, quantity and quality since the time the evaluation was completed (2003; data from 2000 to 2003), that may allow use of this lower quality water source?

RESPONSE: All information provided regarding the Port St. Johns' operations and reclaimed water supply is per FPL's conversation with Brevard County North Area Utilities Superintendent Mr. Scott Linkenhoker on February 9, 2009.

Operations at the Port St. Johns' Publicly Owned Treatment Works (POTW) remain unchanged in terms of reliability, quantity, and quality since FPL last performed a Cape Canaveral Reuse Feasibility Study. The package plant has not changed in design capacity, flows, or treatment process. The facility would need to be completely redesigned to address the necessary nutrient removal requirements for FPL's process use. While the number of upsets has been reduced this is due to the POTW ceasing the use of nutrient removal chemicals which were identified by the plant as the root cause. The net output of reclaimed water remains at 0.225 million gallons per day (MGD) annual average. Therefore, as per the conclusions reached in the Cape Canaveral Reuse Feasibility Study submitted by FPL to SJRWMD on May 23, 2008, it is not feasible for the CCEC to utilize reclaimed water from the Port St. Johns POTW for process purposes.

SJRWMD – D2. Please evaluate the potential for using reclaimed water for landscape irrigation at the site.

RESPONSE: FPL has confirmed with the Port St. Johns' POTW that the reclaimed water is of acceptable quality for irrigation purposes at the CCEC, and FPL plans to use it for that purpose provided sufficient water volume is available. Please see the completed UL-1 Form for more information regarding CCEC use of reclaimed water for irrigation (see Attachment SJRWMD D2).

SJRWMD – D3. Since landscape irrigation is included in the project, please complete the Landscape Irrigation Type Use form (UL-1).

RESPONSE: Included in the response to comment SJRWMD-D2.

SJRWMD – D4. District rule requires using the lowest acceptable quality water source, including reclaimed water for each consumptive use. In light of the fact that this is a new plant, the reclaimed pipeline is already constructed, and circumstances at the reclaimed plant may be more favorable for this use, it will be necessary to evaluate if it is economically, environmentally, or technologically feasible to use this source.

RESPONSE: All information provided regarding the Port St. Johns operations and reclaimed water supply is per FPL's conversation with Brevard County North Area Utilities Superintendent, Mr. Scott Linkenhoker, and Mr. Ed Cantwell, Merrit Island POTW Superintendent, on February 9, 2009.

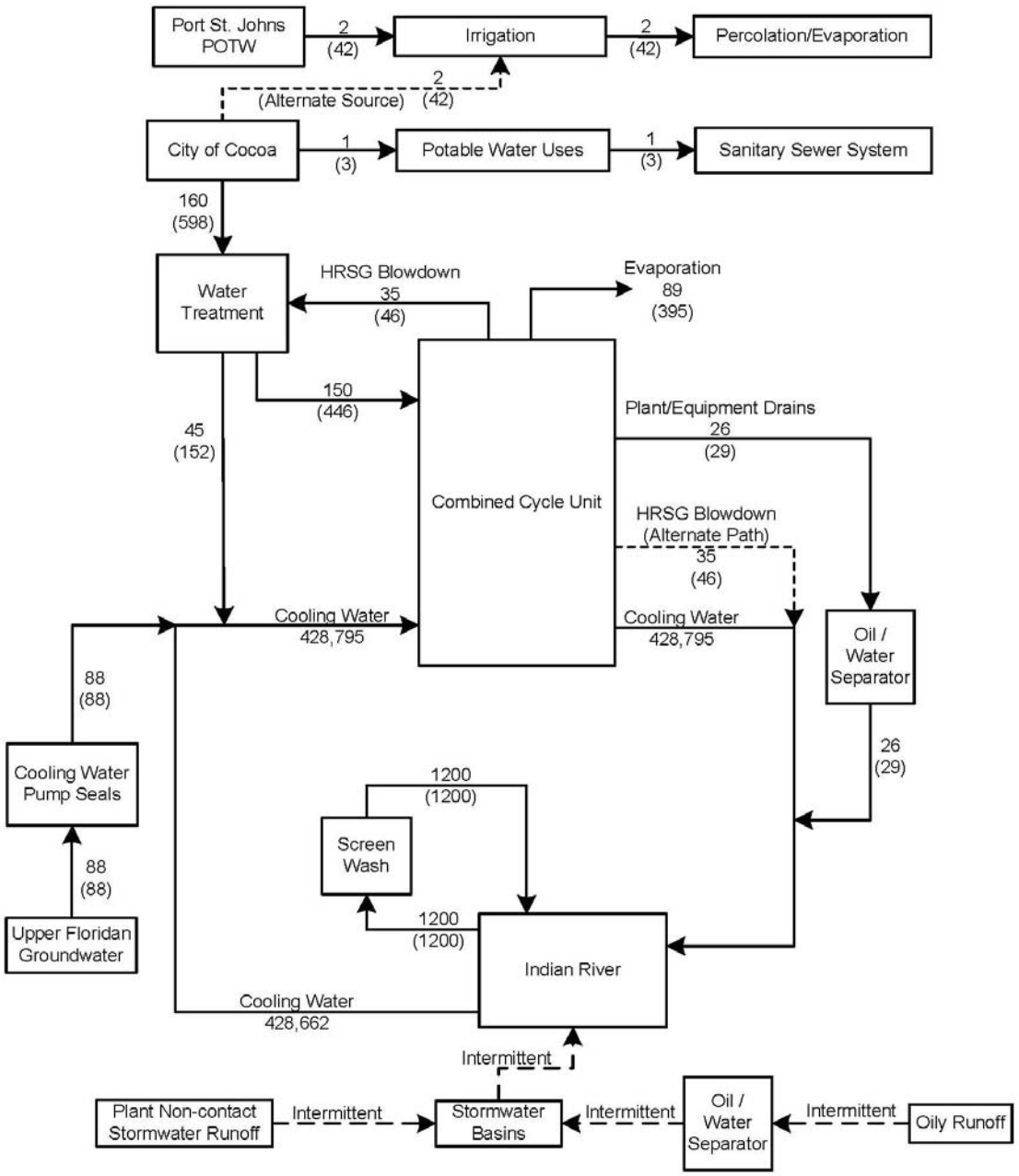
Due to the fact that circumstances including design capacities, flows, and treatment processes at the Port St. Johns POTW remain unchanged in terms of reclaimed water reliability, quantity, and quality since FPL performed its Cape Canaveral Reuse Feasibility Study in 2008, the conclusions presented to the SJRWMD remain valid. FPL intends to utilize the same type of water treatment technology to supply the operations of the CCEC as is used at the current facility. The Port St. Johns' POTW

cannot produce reclaimed water of the appropriate quailty for the water treatment technology to be used at the converted Plant without FPL exceeding the permitted total maximum daily limits of nutrient loading for discharge to the Indian River Lagoon. Additionally, the Port St. Johns' POTW does not have the system capacity nor the willingness to accept the water treatment plant reject wastewater at this time.

Therefore, due to multiple economic, environmental, and technical reasons, the use of reclaimed water for any purpose other than landscape irrigation is still infeasible at CCEC. This is the same conclusion with which SJRWMD concurred after review of last year's submittal.

SJRWMD – E. Construction dewatering is described on p. 5-8. Please complete the applicable sections of the Dewatering Type Use form (DW-1).

RESPONSE: See Attachment SJRWMD E for the requested material.



Notes:
1. Flows are in gallons per minute unless otherwise noted.
2. Flows shown with no () are based on average daily water use.
3. Numbers in () are peak intermittent flows.
4. Dashed lines indicate intermittent or alternate flow paths as noted.

Figure 4.5.0-1 (Revised)
Cape Canaveral Energy Center – Water Balance
SJRWMD-A.docx

Source: Golder, 2009.

ATTACHMENT SJRWMD B1

LAYNE-ATLANTIC COMPANY

WELL TEST DATA

Work Order Number 51885 Customer Florida Power & Light Corporation Well Number 3

STATIC WATER LEVEL BEFORE PUMPING Feet _____ Inches 4"

PUMPING TEST BEGAN 9:30 O'CLOCK AM X PM ___ DATE August 11, 1969

TIME	YIELD IN GALLONS PER MINUTE	
	RPM	GPM
9:30 AM		100
10:30 AM		100
11:30 AM		100
12:00 NOON		110
1:00 PM		110
2:00 PM		110
2:00 PM		120
2:30 PM		120
:00 PM		120
	COMPLETE RECOVERY IN 10 sec	
	W.L. 4" above G.L. after P	

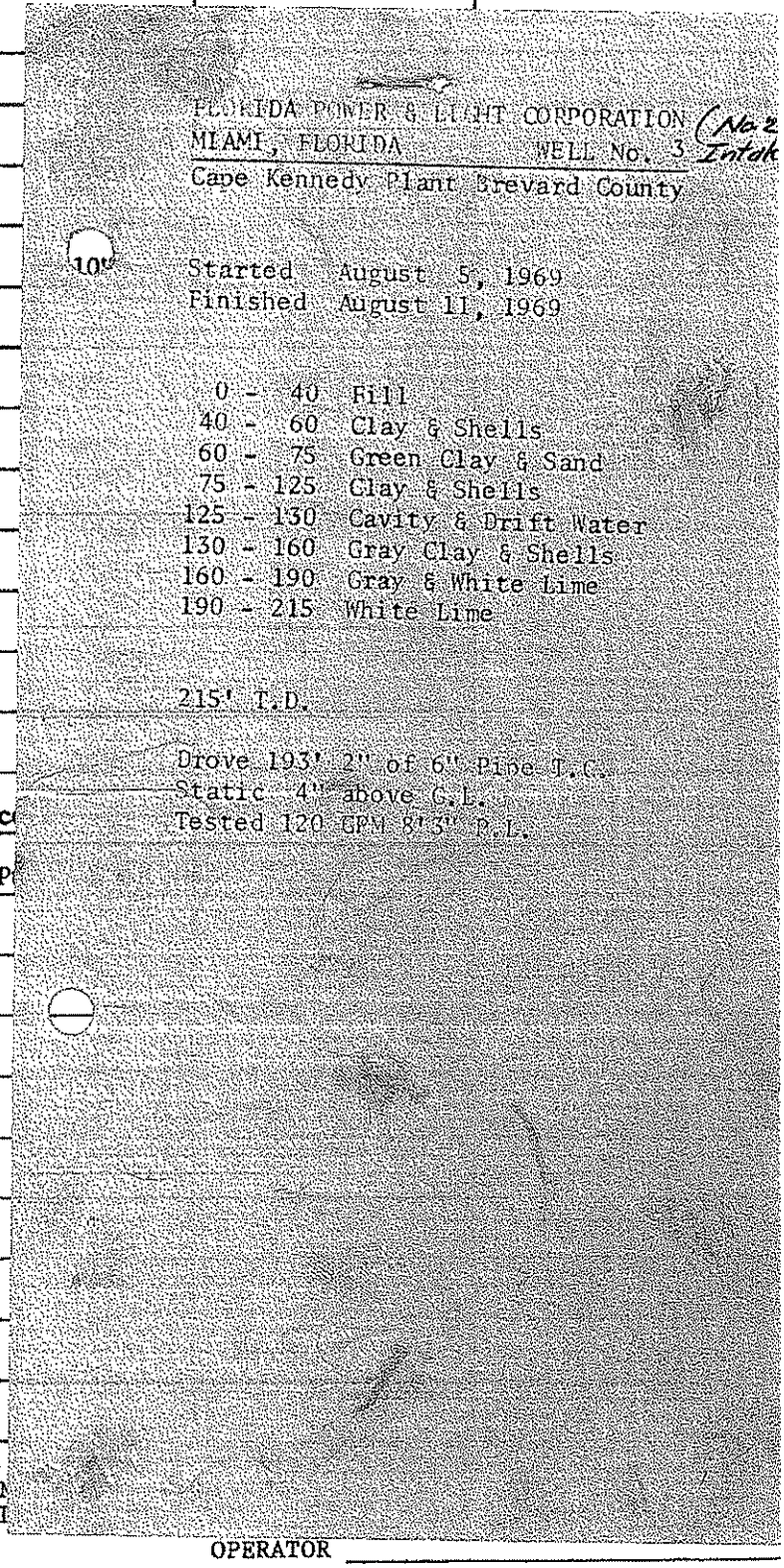
PUMPING TEST COMPLETED _____ O'CLOCK AM

STATIC WATER LEVEL THREE MINUTES AFTER TEST CO

STATIC WATER LEVEL SIX MINUTES AFTER TEST COMPL

USE BACK OF PAGE FOR REMARKS.

OPERATOR _____



SJRWMD D2

LANDSCAPE IRRIGATION USE

(Submit 2 copies of application, supplemental information, drawings, calculations, etc.)

1. Complete this chart if water is requested for irrigation of lawns, common areas, aesthetic or recreational areas.

TYPE OF VEGETATION	NO. OF ACRES	IRRIGATION METHOD	AMOUNT REQUESTED (Mgals/Year)*	SOURCE NAME (lake, or well ID)
Shrubs/groundcover	.52	Spray heads	.73 Mgals/Year	reclaimed water
Trees/Palms	.06	Bubblers	.16 Mgals/Year	reclaimed water
TOTALS	.58	Mixture	.89 Mgals/Year	reclaimed water

2. Attach 2 copies of the following:

X a. Map (including scale) showing outline of irrigated areas according to vegetation type.

X b. List of all surface water bodies on or adjacent to the property boundary. Include lakes, ponds, rivers, canals etc. Indian River Lagoon

NA c. List of all wastewater treatment plants within a 5 mile radius of project. Provide the name and address of a contact person design capacity, current wastewater flows, and level of treatment.

Form: 40C-2-1082-1; Effective 1-7-99

PLANTING NOTES

1. All plant materials shall be graded Florida No. 1 or better as outlined under Grades and Standards for Nursery Plants 2nd ed. State Plant Board of Florida unless otherwise noted.
2. All plant beds shall be top dressed with 3" Grade "B" or better shredded Cypress bark mulch.
3. Fertilizer shall conform with ANSI A-300 part 2 fertilization standard. Fertilizers for trees and shrubs shall have a ratio of 3:1:1 or 3:1:2. Fertilizers for palms shall have a ratio of 3:1:3. A minimum of 50% of the total nitrogen shall be water-insoluble. Fertilizers shall have a salt index of less than 50. Fertilizers shall be applied at a rate of 2-4 lbs. of nitrogen per 1,000 square feet per application, not to exceed 6 lbs. of nitrogen per 1,000 square feet annually.
4. Starter fertilizer shall be 6-6-6, 100% organic, with minor elements. This fertilizer shall have 40-50% of its total nitrogen in a water-insoluble form.
5. Lawn areas shall be treated with starter fertilizer applied at a rate of twenty (20) pounds per 1000 square feet.
6. Methods of tree planting and staking indicated on the drawings shall be followed. The Landscape Contractor shall be held liable for any damages caused to trees by improper staking methods, (or absence of staking) and is responsible for uprighting and replanting trees which are blown over.
7. Apply pre-emergent granular or spray application to all plant beds and turf areas after completion of landscape installation (after installation of mulch). Use product labeled for landscape application. (Follow manufacturer's recommended rates of application).
8. In the event of a discrepancy between drawings and the plant schedule, the drawings shall prevail.
9. Prior to construction, the contractor shall be responsible for locating all underground utilities and shall avoid damage to all utilities during the course of work. The contractor is responsible for repairing all damage to utilities.

Alternative Landscape Enhancement Plan Calculations

Total Project Area:	76.00	ac.
Land Use:	Industrial	
Required Canopy Preservation:	7.60	ac.
	10.00%	
Provided Canopy Preservation:	12.11	ac.
	15.93%	
Required Planted Canopy:	7.60	ac.
	10.00%	(5% planted plus 5% ALEI*)
Provided Planted Canopy:	3.20	ac.
Total Required Canopy:	15.20	ac.
Total Provided Canopy:	15.31	ac.
	20.14%	
Surplus Habitat Preservation:	4,771.65	s.f.
Type B Roadway Buffer:	2,155	l.f.
Parking VUA:	222	spaces
Non-parking VUA:	127,237.15	s.f.

Landscape Performance Standard	REQUIRED	PROVIDED	
Required Trees:	380	3,371	(331 ex. trees on east side of US-1, plus preservation on the west side of US-1, and all buffers)
Required DBH:	4,560	11,305	(see estimated totals for preserved areas on the west side of US-1)
Required Shrubs/GC:	19,152	34,788	(based on 16 s.f. of understory preservation = 1 shrub, plus Type B buffer)
Type A Buffer	yes	yes	(met by existing 6' CMU wall and/or opaque wooden fence, along with transplanted Cabbage Palms)

Type B Buffer			
Required Area:	32,779	s.f.	(15' width by the required length)
Provided Area:	34,762	s.f.	(15' width on west, varying width on east - min. 12.5' between ex. wall and ROW)
	REQUIRED	PROVIDED	
Group 1 Plants (Shrubs - 3' ht.)	546	546	(7-gal shrubs are counted as 2 of required shrubs)
Group 2 Plants (Trees - 8' ht.)	87	111	
Group 3 Plants (Groundcover - 12" ht.)	728	2,187	(13,666 s.f. planting beds at assumed 30" o.c. spacing of plants.) (Three 1-gal groundcovers are counted as 1 of required shrubs)

Vehicular Use Areas	REQUIRED	PROVIDED
Parking Lot Trees	22	22
Non-parking VUA LS Area	3,181	3,181
Non-parking VUA Trees	11	11

NOTE: Due to national security, safety considerations, and operational constraints on this industrial site, the vast majority of the vehicular use area landscape areas and plant materials are located around the perimter of the site, and are met by preservation of existing material.

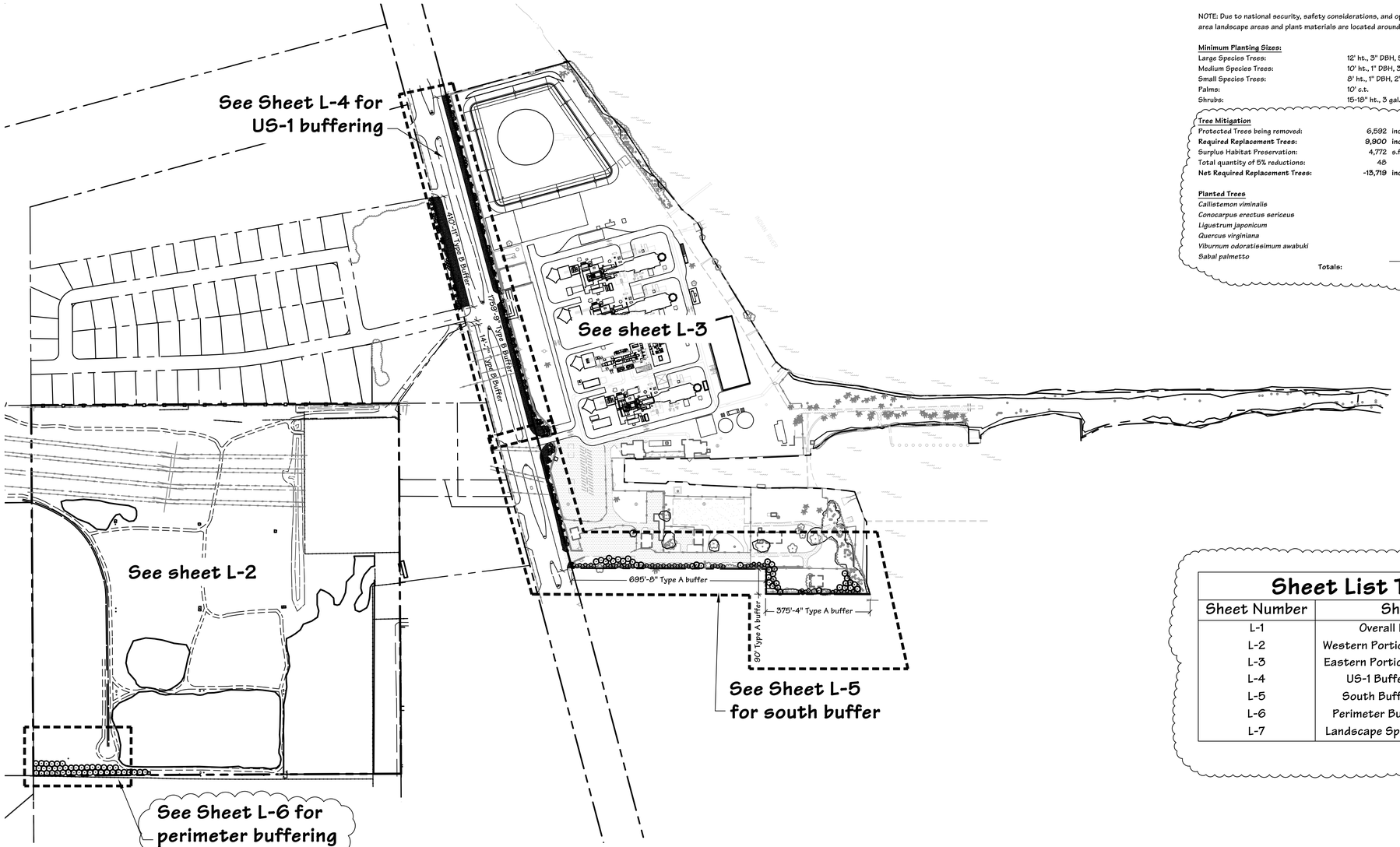
Minimum Planting Sizes:

Large Species Trees:	12' ht., 3" DBH, 5' sp.
Medium Species Trees:	10' ht., 1" DBH, 3' sp.
Small Species Trees:	8' ht., 1" DBH, 2' sp.
Palms:	10' c.t.
Shrubs:	15-18" ht., 3 gal.

Tree Mitigation

Protected Trees being removed:	6,592	inches (see tabular data on sheet L-2)
Required Replacement Trees:	9,900	inches (see tabular data on sheet L-2)
Surplus Habitat Preservation:	4,772	s.f. (preserved scrub habitat)
Total quantity of 5% reductions:	48	(per Section 62-4343(2)b)
Net Required Replacement Trees:	-13,719	inches (9900 minus 9900 x .05 x 48)

Planted Trees	QTY	DBH	Total DBH	Canopy	Total Canopy	
Callistemon viminalis	35	1	35	33	1,155	s.f.
Conocarpus erectus sericeus	21	1	21	123	2,583	s.f.
Ligustrum japonicum	37	1	37	123	4,551	s.f.
Quercus virginiana	79	3	237	1,590	125,610	s.f.
Viburnum odoratissimum awabuki	18	1	18	79	1,422	s.f.
Sabal palmetto	63	N/A	N/A	33	2,079	s.f.
Totals:	253		348		137,400	s.f.
					3.2	ac.



Sheet List Table	
Sheet Number	Sheet Title
L-1	Overall Landscape Plan
L-2	Western Portion Existing Conditions
L-3	Eastern Portion Existing Conditions
L-4	US-1 Buffer Landscape Plan
L-5	South Buffer Landscape Plan
L-6	Perimeter Buffer Landscape Plan
L-7	Landscape Specifications & Details

PRELIMINARY
Issued for Review
NOT FOR CONSTRUCTION.

North

FIGURE SJRWMD D2-1

Scale: 1" = 200'
Date: 12/18/2008
Date Plotted: 2/13/09

Drawing History

Per Client comments	1/12/09
Per Client/County comments	1/19/09
Per final survey	2/11/09
Per Client comments	2/13/09
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Overall Landscape Plan

Cape Canaveral Energy Center
Brevard County, FL

"Enhancing Community through PLACE CREATION"

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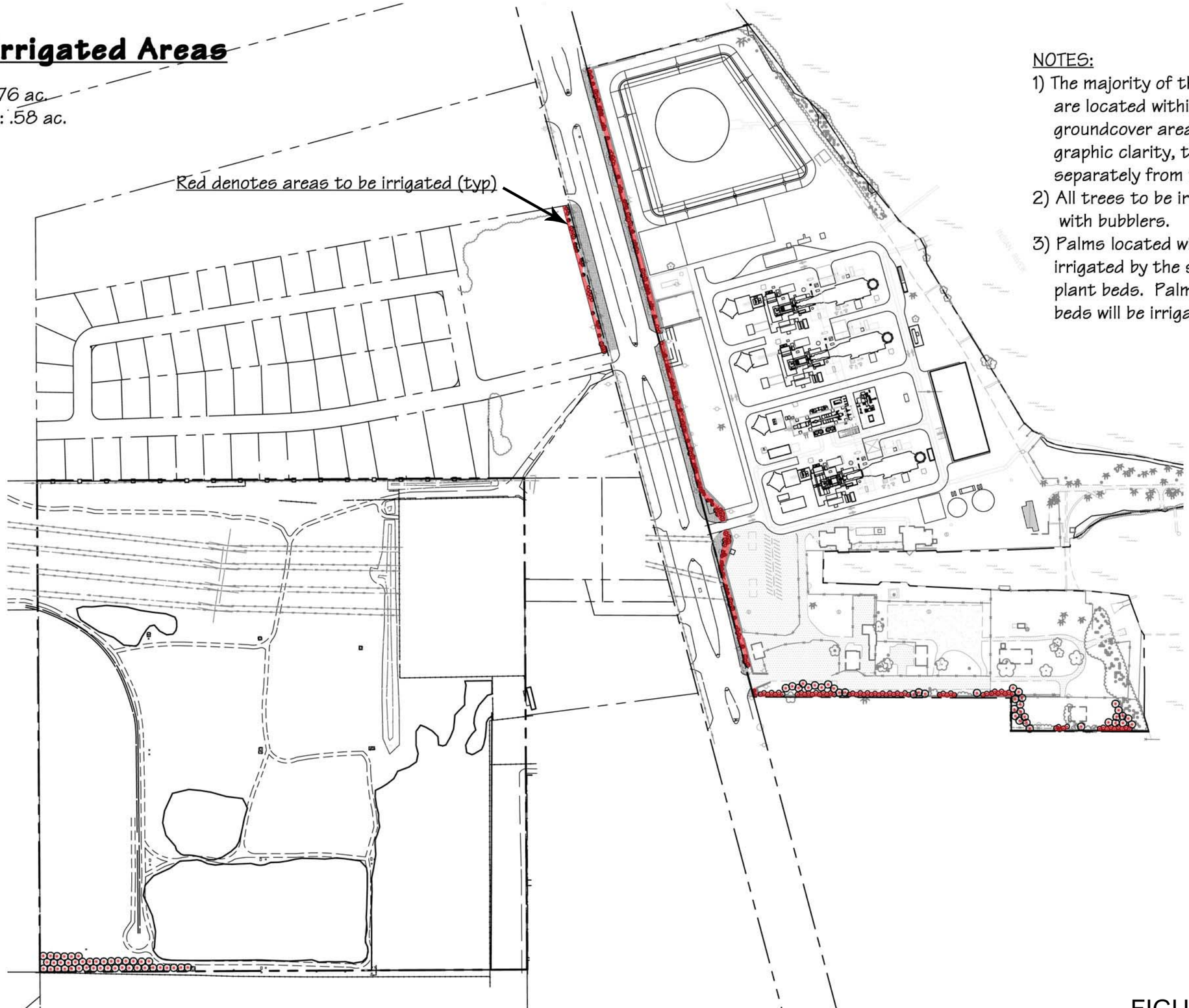
Sheet Number
L-1
1 of 7

Project #: 157-615-01

Proposed Irrigated Areas

Total Project Area: 76 ac.
Total Irrigated Area: .58 ac.

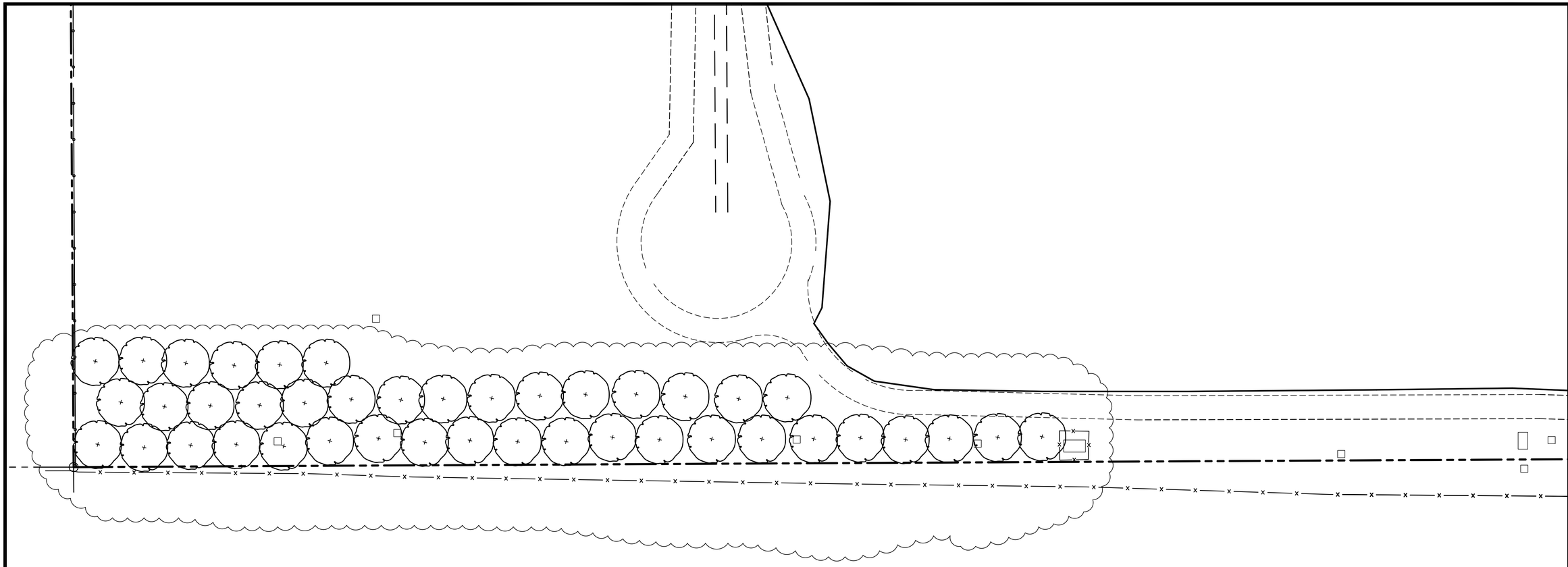
Scale: 1" = 300'



NOTES:

1) The majority of the trees to be irrigated are located within plant beds (shrubs/ groundcover areas to be irrigated). For graphic clarity, they are not depicted separately from the plant beds.
2) All trees to be irrigated shall be provided with bubblers.
3) Palms located within plant beds will be irrigated by the spray heads watering the plant beds. Palms located outside plant beds will be irrigated with bubblers.

FIGURE SJRWMD D2-2



PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL/COMMON	CONT	CAL	SIZE
	CV	35	Callistemon viminalis / Weeping Bottle Brush Standard	30 gal	1" DBH	8-10` x 5-6`
	CS	21	Conocarpus erectus senceus / Silver Button Wood Standard.	B & B	1" DBH	10-12` x 5-6`
	LJ	37	Ligustrum japonicum / Japanese Privet multi-trunk. 2.5-3` c.t. SPECIMEN	B & B	1" DBH	8-10` x 6-8`
	QV	79	Quercus virginiana / Southern Live Oak	B & B	3" DBH	16-18` x 9-10`
	VA	18	Viburnum odoratissimum `Awabuki` / Awabuki Viburnum 2` c.t., multi.	25 gal	1" DBH	8-10` x 4-5`

PALM TREES	CODE	QTY	BOTANICAL/COMMON	CONT	CAL	SIZE
	PRO	41	Phoenix roebelenii / Pygmy Date Palm triple. SPECIMEN	B & B		5-6` o.a.
	SP	63	Sabal palmetto / Cabbage Palm relocated from west side of US-1	Existing		

SHRUBS	CODE	QTY	BOTANICAL/COMMON	CONT	SIZE
	CH	14	Chamaerops humilis / Mediterranean Fan Palm	15 gal	36" x 30-36"
	VO	532	Viburnum odoratissimum / Sweet Viburnum	7 gal	30-36" x 24-30"

GROUND COVERS	CODE	QTY	BOTANICAL/COMMON	CONT
	SB	269	Spartina baken / Sand Cord Grass	1 gal@ 60" oc

SOD/SEED	CODE	QTY	BOTANICAL/COMMON	CONT
	PA	45,666 sf	Paspalum notatum `Argentine` / Bahia Grass	sod

PRELIMINARY
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FIGURE SJRWMD D2-3

North

Scale: 1" = 20'
Date: 12/18/2008
Date Plotted: 2/13/09

Drawing History

Per Client comments	1/12/09
Per Client/County comments	1/19/09
Per final survey	2/11/09
Per Client comments	2/13/09
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Perimeter Buffer Landscape Plan

Cape Canaveral Energy Center
Brevard County, FL

"Enhancing Community through PLACE CREATION"®

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Registration:
FL Reg. LA Corp. #0000305

Sheet Number
L-6
6 of 7

Project #: 157-615-01

Attachment SJRWMD E

Form DW-1 Attachment

Cape Canaveral Energy Center Project

Response to Request for Additional information

St. Johns River Water Management District

1a. An overview description of the Cape Canaveral Energy Center (CCEC) Project is provided in Chapter 1 of the Site Certification Application (SCA). Dismantlement of the existing Plant facilities is anticipated to begin in the spring of 2010 and Project construction is anticipated to conclude in the summer of 2013. During dismantlement of the existing Plant and construction of CCEC, dewatering activities will be required. A general description of the dewatering activities is discussed in Section 5.2.1.3 of the SCA. Table SJRWMD E-1 to this attachment provides a summary of the anticipated dewatering requirements for the major elements of CCEC. Also shown in the table are the conceptual plan dimensions of the foundations, the depth to the bottom of the excavation, the dewatering depth, the lateral extension of excavation that may be required for safe sloping and the anticipated construction duration for each element in months. The exact sequencing of these construction activities has not been finalized. Consequently, the overall duration of the dewatering activities is not known, but it is expected to last between 6 and 12 months.

1b. Conceptual dewatering elements and depths of dewatering are shown in Table 1. Dewatering methods and locations of withdrawal points have not been finalized at this time. However, dewatering methods are expected to include well points, under drains, vacuum wells and other standard extraction techniques. Engineering controls, such as sheet pile, slurry walls, tremie slabs or other similar methods, may be used, as necessary, to reduce inflow.

1c. The surficial aquifer will be dewatered for construction purposes.

1d. Methods that may be used to control the water quality of the dewatering effluent are discussed in Section 5.2.1.3 of the SCA. The dewatering effluent will be tested and monitored to ensure that any discharge to surface waters will meet Class II water quality standards. If necessary, a water treatment system will be designed and installed to treat the dewatering effluent before discharge to surface waters. The monitoring and treatment requirements and the treatment system design have not been finalized at this time.

1e. For a power plant construction project, a final detailed dewatering plan is usually developed in conjunction with the construction contractor and the contractor's dewatering subcontractor;

neither is available at this point in the development process. Consequently, a detailed dewatering plan, with specified dewatering activities, sequencing schedules, methods, withdrawal points, water quality monitoring plans, water table drawdowns and, if necessary, a water treatment system design, have not been developed at this time. FPL will provide a detailed dewatering plan with this information to the SFWMD for review and approval before dewatering activities begin.

1e.4) Figure 3.3.5-1 in the SCA provides a vegetation/land use map for CCEC. Except for the Indian River Lagoon and some adjacent mangrove swamps east of the Site, which will not be impacted by dewatering activities, there are no significant wetlands within ¼ mile of the Plant boundary.

1f. See discussion in 1e, above.

1g. Not applicable. This project involves construction activities; it does not involve mining activity.

1h. Not applicable. There will be no commercial/industrial processing activities on the Site during construction.

2. Dewatering activities will take place for approximately a 12-month duration, sometime between 2010 and 2013. The expected average dewatering rate is 1,750 gpm, or 2.52 MGD. The annual withdrawal from groundwater is expected to be 920 mgy. No surface water withdrawals are required for construction dewatering.

TABLE SJRWMD E-1
CAPE CANAVERAL ENERGY CENTER PROJECT
APPROXIMATE PLAN DIMENSIONS AND DEPTHS FOR FOUNDATIONS & EXCAVATIONS REQUIRING DEWATERING

ITEM		Plan Dimensions of Foundations		Depth to Bottom of Excavation (feet)	Dewatering Depth (feet) [1]	Anticipated Lateral Extension of Excavation Due to Safe Sloping [2]	Construction Duration (Months)	Remarks
		Width [N-S] (feet)	Length [E-W] (feet)					
HRSG Foundation		58	152	6	10	9' Around Extents	2	Units 1, 2, 3
CT Foundation [3]	(A) - North	52	64.7	4	8	6' Around Extents	1.5	Units 1, 2, 3
	(B) - Middle	37	13.3				1.5	
	(C) - South	56	40				1.5	
CT Step-Up XFMR		52	38	4	8	6' Around Extents	0.75	Units 1, 2, 3
CT Unit Aux XFMR		37	26	4	8	6' Around Extents	0.75	Units 1 & 2
ST Foundation [3]	(A) - North	45	27	6	10	9' Around Extents	3	Units 1, 2, 3
	(B) - Middle	75	34				3	
	(C) - South	29	36				3	
ST Step-Up XFMR		52	42	4	8	6' Around Extents	0.75	
ST Condensate Pumps		3	3	20	24	30' Around Extents	1	
ST Blowdown Tank [4]		8	8	14	17	21' Around Extents	0.75	
Intake Circulating Water Lines [5]		9'-3" f	800	12	15	18' Around Extents	4.5	Intake Trench from Existing Intake Structure to the ST
Discharge Circulating Water Lines [5]		9'-3" f	1340	12	15	18' Around Extents	5.5	Discharge Trench from ST to Existing Discharge Structure

Notes: (1) Dewatering assumed at 2 feet below excavation plus an additional 1 to 2 feet to account for cone of influence.
(2) Based on OSHA guidelines, the on-site sandy soils are classified as Type C soils which should be excavated with a maximum slope of 1.5:1 (H:V).
(3) CT & ST Foundations broken up into 3 sections due to not being rectangular in shape
(4) ST Blowdown Tank - assumed depth & measured plan dimensions
(5) Circulating Water Lines assumed to have at least 3-foot of soil cover and 1 foot of bedding.
(6) Due to the shallow nature of the other foundations across the site, dewatering likely will not be required of their associated excavations.

ECFRPC RESPONSES

EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL COMMENTS

ECFRPC – A.a. RE: Temporary Manatee Heating System:
How will the effectiveness of this beating system be evaluated?

RESPONSE: The temporary manatee heating system effectiveness will be evaluated to verify that the system discharges the amount of thermal energy that was used in the model described in the SCA. The amount of thermal energy discharged will be determined by measuring the water flow rate and temperature rise through the heating system and calculating the thermal energy that is discharged. FPL will monitor the manatees in accordance with the current FPL Cape Canaveral Plant Manatee Protection Plan.

ECFRPC – A.b. RE: Temporary Manatee Heating System:
Is there a plan in place to monitor the manatees and their response to the heating system?

RESPONSE: FPL will monitor the manatees in accordance with the current FPL Cape Canaveral Plant Manatee Protection Plan.

ECFRPC – B. The FPL Cape Canaveral Manatee Protection Plan was not included in the report as an attachment.

RESPONSE: An electronic copy of the FPL Cape Canaveral Manatee Protection Plan was emailed to Tara McCue on January 26, 2009.

ECFRPC – C.a. Scrub jay and gopher tortoise habitat is found adjacent to the site. Although the report states no noise sensitive wildlife is known to occur in the vicinity of the site and wildlife in the area would have been acclimated to noise associated with Plant Operations, will ground vibrations during the 3 year construction project negatively impact the species, especially gopher tortoise?

RESPONSE: Habitat for gopher tortoises and scrub jays is located in and adjacent to the construction laydown and parking area. Gopher tortoises within this area and within a 25 foot buffer of the area will be relocated pursuant to Florida Fish and Wildlife Conservation Commission (FFWCC) guidelines. Mitigation for impacts to scrub jay habitat, if needed, will be determined in consultation with the United States Fish and Wildlife Service (USFWS). Wildlife in the area are acclimated to the noise associated with Plant operations, traffic and activity associated with U.S. Highway 1, and the active rail line located to the west of this area. While the additional ground vibration associated with activities at this area may be perceptible to gopher tortoises adjacent to the construction parking and laydown area west of U.S. Highway 1, it is not expected to negatively impact the species.

ECFRPC – Cb. Scrub jay and gopher tortoise habitat is found adjacent to the site. Is there a monitoring plan in place to determine if the species are adversely affected or displaced over a period of time?

RESPONSE: No monitoring plan is currently in place regarding scrub jays or gopher tortoises located adjacent to the Site. FPL will work the FFWCC and the USFWS to avoid, minimize, and/or mitigate any impacts to scrub jays and gopher tortoises on FPL-owned properties adjacent to the Site, if determined necessary to mitigate for impacts related to the conversion Project.

BCBOCC RESPONSES

BREVARD COUNTY COMMENTS

BCBOCC–A. The parcels and boundary shown on the landscape plans, sheets 1 and 2, do not match the boundary shown on sheet 4-A of the conceptual site plan.

RESPONSE: The parcel and boundary descriptions that were originally submitted to Brevard County in the "Addendum to the Local Approval Application" on December 30, 2008, and in supplemental information to the local approvals on January 21, 2009, have been updated for consistency on the landscape plans (sheets 1 and 2). The updated plans were provided to Brevard County on February 16, 2009, and are available to others upon request.

BCBOCC–B. The legal description in the Ownership and Encumbrance (O&E) report for the property on the West side of US-1 must match the legal description on the conceptual site plan and the boundary survey of the property. Provide 2 signed & sealed boundary & topographic surveys which have been prepared with the benefit of the O&E report so that all matters of record can be shown (if plottable) and/or noted on the survey (if the easements are no longer applicable or do not encumber the property the survey must note this in a note on the survey.)

RESPONSE: The legal description has been updated for the property on the west side of U.S. Highway 1 for consistency with the O&E Report that was originally submitted to Brevard County in the "Addendum to the Local Approval Application" on December 30, 2008, and in supplemental information to the local approvals on January 21, 2009. The updated site survey (two copies signed and sealed) was provided to Brevard County on February 27, 2009. The updated legal description included in the conceptual site plan drawings was provided to Brevard County on March 2, 2009.

BCBOCC–C. The O&E report which was provided has descriptions of 17 parcels, where as the survey of the parcel lying east of US Highway 1, only uses descriptions 5 thru 17 (please explain.) Is the property that is to be used for the laydown area described in the O&E report as parcels 1 thru 4? If so the survey that was provided does not match any of the remaining legals in the O&E report.

RESPONSE: In the O&E Report that was originally submitted to Brevard County in the "Addendum to the Local Approval Application" on December 30, 2008, and in supplemental information to the local approvals on January 21, 2009, parcels 5 through 17 describe the Project Site east of U.S. Highway 1. Parcel 1 describes the construction parking and laydown area west of U.S. Highway 1. Parcels 2, 3, and 4 are owned by FPL, but are not included in the CCEC Project Area. This description was provided to Brevard County on February 27, 2009.

BCBOCC–D. The location and width of existing easements and proposed easements must be shown on the site plan. The intended use shall be clearly stated. Where easements are not coincident with property lines, they must be labeled with bearings and distances and tied to project site boundary lines. The O&E report identifies numerous easements (6 counted) which are not shown on the survey. All these easements must be accounted for whether they are shown graphically on the survey or noted as "no longer" or "does not" encumber subject property. Please modify survey note #2 if needed (It does not appear that the surveyor prepared these descriptions. It appears that the descriptions are from deeds of record.)

RESPONSE: The description of existing easements is provided on the conceptual site plan (sheet 3) and the site survey that were originally submitted to Brevard County in the "Addendum to the Local Approval Application" on December 30, 2008 and in supplemental information to the local approvals on January 21, 2009. The updated site survey (two copies signed and sealed) was provided to Brevard County on February 27, 2009. The updated conceptual site plan (sheet 3) was provided to Brevard County on March 2, 2009. These materials are available to others upon request.

BCBOCC–E. The Construction Laydown and Parking Area sheet (4 A) is different from the areas shown on sheets L-I and L-2 of the landscaping plan. Are the areas shown on Sheets L-I and L-2 included in the SAC? If so, please revise Ownership and Encumbrance report, SAC, conceptual site plan and the boundary survey to include the property.

RESPONSE: The parcel and boundary descriptions have been updated for consistency on the landscape plans (sheets 1 and 2) and the conceptual site plan (sheet 4-A) that were originally submitted to Brevard County in the "Addendum to the Local Approval Application" on December 30, 2008, and in supplemental information to the local approvals on January 21, 2009. The updated landscaping plans were provided to Brevard County on February 16, 2009. No modifications were required for sheet 4-A of the conceptual site plan drawings. These materials are available to others upon request.

BCBOCC–F. Provide the Storm Water Pollution Prevention Plan (SWPPP) for the project construction site on the east and west side of US-1. Also, depict all the improvements that are listed in section 4.8.1.2 and section 4.8.2. of the SCA.

RESPONSE: Comment acknowledged. Attachment BCBOCC-F contains a conceptual Storm Water Pollution Prevention Plan for the Project construction site on the east and west side of U.S. Highway 1. Based on conversations held with Brevard County on February 27, 2009, it is not necessary to depict improvements listed in Subsections 4.8.1.2 and 4.8.2 of the SCA at this time. FPL will require the contractor to develop and implement an environmental control program for the construction activities at the Site that includes a final Stormwater Pollution Prevention Plan (including figures that will depict improvements listed in Subsections 4.8.1.2 and 4.8.2 of the SCA).

BCBOCC G. The ability to impact jurisdictional wetlands shall be evaluated according to Brevard County Comprehensive Plan, Conservation Element, Objective 5. Any impacts to state-claimed jurisdiction wetlands will require a Board of County Commissioners Public Interest Determination (PID). If the State does not claim the delineated "wetlands" shown on Sheets 6 & 7 of the Boundary Survey as jurisdictional, please provide documentation and this will not be necessary.

RESPONSE: Comment acknowledged. FPL submitted a request on February 12, 2009, to Brevard County to be added to the March 10, 2009, Brevard County Board of County Commissioner consent agenda to receive Public Interest Determination for impacts to state-claimed jurisdictional wetlands.

BCBOCC H. Redevelopment of legally existing impacts within the buffer is permissible; however, new impacts (temporary or permanent) in the surface water protection buffer will require a Board of County Commissioners PID. This request shall be required for completeness. As discussed in our meeting of January 22, 2009, this would best be approached

by requesting the general ability to impact the surface water protection buffer as required as part of plant operations or manatee protection.

RESPONSE: Comment acknowledged. FPL submitted a request on February 6, 2009, to Brevard County to be added to the March 10, 2009, Brevard County Board of County Commissioner consent agenda to receive Public Interest Determination for impacts to the surface water protection buffer as required as part of plant operations or manatee protection.

BCBOCC I. Maintenance dredging requires Board of County Commissioners approval. This request shall be required for completeness. As discussed in our meeting of January 22, 2009, please supply the details regarding the proposed maintenance dredging and associated FDEP exemption documentation.

RESPONSE: Comment acknowledged. FPL submitted request on February 6, 2009, to Brevard County to be added to the March 10, 2009, Brevard County Board of County Commissioner consent agenda to receive Public Interest Determination for maintenance dredging.

Project # 17213.00 (60061022)

Attachment BCBOCC-F

STORM WATER POLLUTION PREVENTION PLAN

for

CAPE CANAVERAL ENERGY CENTER

Section 19 of Township 23 South, Range 36 East
BREVARD COUNTY, FLORIDA

Prepared By:

BOYLE | AECOM

Boyle Engineering
3550 SW Corporate Parkway
Palm City, Florida 34990
(772) 286-3883

March 2009

ENGINEER OF RECORD
Patrick LaConte, P.E.
3/6/09
FL PE DE # 41070

SECTION 1

SITE DESCRIPTION

A. Construction Activities:

The Florida Power & Light Company (FPL) is proposing a conversion of their existing Cape Canaveral Plant on a ±40-acre site located between Cocoa and Titusville, Florida. The site is bounded on the east by the Intracoastal Waterway/Indian River and on the west by U.S. 1 in Section 19, Township 23S, Range 36 E of Brevard County, Florida. The converted plant will be renamed the Cape Canaveral Energy Center (CCEC). The CCEC Project location and areas covered by this Storm Water Pollution Prevention Plan are shown on Figures 3.1.0-1, 3.1.0-2, and 3.1.0-3 of the Site Certification Application.

The ±40-acre Cape Canaveral Plant consists of the operating power plant and the supporting facilities. These facilities include tanks, support buildings, roadways, parking areas, and storage areas. Since this is an existing industrial facility, there is a large amount of impervious area resulting in a large pre-development discharge rate. The site generally slopes west to east towards the Indian River. The change in elevation from the west to east end of the site averages 6-8 feet.

While the Cape Canaveral Plant Site is ±40-acres, the CCEC area will be located to the north of the existing intake canal and amounts to ±23-acres. The ±23-acre CCEC area consists of the power block, administration/control room/warehouse building, pavement, parking areas, open space, and the fuel oil storage tank containment area.

The conversion effort will begin with the demolition of the existing plant and supporting facilities. A new power plant with supporting infrastructure will be built in its place. As part of the proposed infrastructure, a SWMS will be constructed to provide on-site water quality (WQ) treatment and flood attenuation where none currently exists.

The proposed SWMS has been conceptualized as single basin consistent with the existing condition. Water Quality treatment will be provided in a series of interconnected dry retention areas located throughout the project. Runoff will be treated and then discharged into the Indian River at a rate less than the allowable discharge through the existing and/or new outfall locations.

An area to the south of the existing intake canal (±4.5-acres) will be utilized as a construction support area (temporary office trailers, parking, etc). There will also be a ±25-acre area to the west of the Cape Canaveral Plant site and to the immediate west of an existing substation that will be utilized as a construction support area (parking, construction lay-down, staging, etc.). Any potential sediment-laden runoff from these areas will be contained via the use of a hay bale system and/or silt fencing.

Any wetlands onsite shall be undisturbed and protected by appropriate means such as a silt fence.

B. Major Soil Disturbing Activities:

The major soil disturbing activities will include clearing and grubbing, excavation for the underground storm drainage and swales, and excavation for building and equipment foundations. The sequence of construction will generally follow the order of clearing and grubbing, excavation for the storm drainage, excavation of the swales, installation of the foundations, and grading for roadway subgrade and the installation of the pavement courses.

C. Total Area to be Disturbed:

The total area to be disturbed by excavation, grading, and other activities is ±23-acres. The additional ±29.5-acres used for temporary construction support activities will protected as instituted by this SWPPP the same as areas under construction and will be restored to pre-use condition.

D. Receiving Waters:

The general site basin, which consists of parking lots and open area, drains to yard drains and catch basins which interconnect with the existing SWMS and ultimately discharge to the Indian River via four outfall locations. The containment area swale on the northern end of the project collects local runoff and discharges directly to the Indian River and is not connected to the existing SWMS.

The existing Plant containment area basin and the power block/solid settling basin are completely contained and have no positive outfalls during storm events. Water may be drained from the containment area basin to the Indian River via valves, but testing on the water quality must be performed prior to any releases. Runoff from the power block/solid settling basin is treated in one of two solids settling ponds and then transferred to an evaporation/percolation pond. This pond may be drained via valves to the Indian River but only after water quality tests have been performed.

The receiving waters for the converted Plant will be the Indian River, unless treated on site in which case there will be no discharge.

SECTION 2

CONTROLS

A. NARRATIVE:

The sequence of soil disturbing activities and implementation of controls and measures are as follows for the general construction activities:

Clearing and Grubbing:

Based on the existing topography of the project areas, certain areas within the limits of the Project will require temporary silt fences and erosion control devices to contain unfinished soils within the construction area. These controls will be temporary and will be removed following the final stabilization of the disturbed areas.

Excavation Activities:

Excavation for the construction of the proposed SWM system will occur within the limits of the converted Plant area. The limits of construction and project boundaries will be graded to contain all spoil material from the excavation activities on site and any future dewatering activities will provide the necessary containment berms and dikes to prevent uncontrolled off site discharges. Temporary controls will be installed as necessary in the area of the excavation to prevent erosion of unstabilized material and will be maintained until the final stabilization of these areas is completed.

Trenching:

Onsite trenching for the installation of underground facilities will be limited to the converted Plant area. Trenches will be excavated and backfilled on a continuous basis as each underground facility is installed. Spoil material from the trenching activity will be utilized for backfill of the trench. As necessary, dewatering activities will be implemented in stages during the installation of the underground facilities and the groundwater will be controlled on site by berming and diking in the area of the work. All berms and dikes subject to erosion will be stabilized or contained to prevent erosion and runoff from the project area. These controls will be removed following the completion of the underground work.

Grading:

Grading for the project will be completed in phases as each section of the work progresses. Rough grading will occur following the clearing and grubbing activities. Final grading will be completed following the installation of the underground facilities and following the road installation. Temporary controls will be installed along the limits of the work as necessary, and these controls will be removed following final stabilization.

B. EROSION AND SEDIMENT CONTROLS:

The following methods of erosion and sediment control will be utilized for the proposed project:

Stabilization practices - The proposed work will be stabilized on an interim and permanent basis as the work progresses. Stabilization practices will consist of seeding, mulching and sodding. At the end of construction activities, the side slopes of the detention areas (above the control elevation) will be permanently stabilized. Also, at the end of construction activities, all disturbed areas will be stabilized.

Structural practices - Structural practices will be implemented during construction as temporary controls. These items will consist of the following:

1. Berms and dikes for containment of runoff and for dewatering activities.
2. Silt fences for perimeter controls.
3. Rock bags for inlet and offsite swale protection.

Temporary erosion control shall be implemented prior to and during construction and permanent control measures shall be completed within ninety (90) days of the completed construction activities (See Figures "A" and "B" for details).

C. STORM WATER MANAGEMENT:

Construction activities will include the installation of swales, berms, underground piping for storm water conveyance, and construction of several dry retention ponds with two control structures using existing and/or new outfall locations for storm water treatment and attenuation.

Upon completion of the project, storm water runoff will be directed to the SWM system for water quality treatment and flood protection. Runoff will be directed to the SWM system by swales, inlets, underground drainage pipes and sheet flow over grassed areas.

The converted Plant will be constructed with appropriate approvals from regulatory agencies per the Conditions of Certification.

D. OTHER CONTROLS:

1. **Waste Disposal:** The contractor shall provide litter control and collection of materials within the project boundaries during construction. All fertilizer, hydrocarbon, or other chemical containers shall be disposed of by the contractor in accordance with State and local regulations. No solid material, including building and construction material, shall be disposed of, discharged, or buried on site.

2. **Off Site Vehicle Tracking:** Loaded haul trucks shall be covered with a tarpaulin. Excess dirt material on the roads shall be removed immediately. Hauling on unpaved surfaces shall be monitored to minimize dust and control erosion. Haul roads shall be watered or other controls provided as necessary to reduce dust and control sediments.

3. **Sanitary Waste:** The contractor shall provide portable sanitary waste facilities. These facilities shall be collected or emptied by a licensed sanitary waste management contractor as required by state regulations.

4. **Fertilizers and Pesticides:** Fertilizer shall be applied at a rate specified by the FDOT Road and Bridge Specifications, latest edition or the manufacturer. The application of fertilizers shall be accomplished in a manner as described by the manufacturer to ensure the proper installation and to avoid over fertilizing. Pesticides are not anticipated for this project.

E. APPROVED STATE AND LOCAL PLANS:

The project will be constructed with appropriate approvals from regulatory agencies per the Conditions of Certification. The contractor will implement the measures and controls, outlined above, during construction. These measures and controls will provide the necessary pollution prevention and sedimentation control during construction.

SECTION 3

MAINTENANCE

The contractor will be responsible for maintenance and repairs of erosion and sediment control devices and removal of the erosion and sediment control devices after the project has been completed and the notice of termination is executed.

The contractor shall inspect the project and all erosion and sedimentation controls on a weekly basis and following rainfall events. The following practices will be implemented to maintain and monitor erosion and sedimentation controls:

A. Project inspections on a weekly basis.

B. Provide and maintain rain gauges on site to record rainfall data daily.

C. Review stabilization practices and controls on a weekly basis, and maintain and repair these measures and controls as necessary. Temporary and permanent seeding, mulching, and sodding shall be repaired in bare spots and washouts until healthy growth is established.

D. Review structural practices on a daily basis and maintain and repair these measures and controls as necessary. Built up sediments shall be removed from silt fences; rock bags shall be replaced as necessary and when they have served their usefulness.

E. An inspection and maintenance report shall be completed weekly and following a rainfall event of 0.50 inches of more (see attached form).

F. Points of discharge of stormwater runoff from the site shall be inspected on a weekly basis and following rainfall events. Controls and measures shall be repaired as necessary.

SECTION 4

INSPECTIONS

Qualified personnel shall inspect all points of discharge, as applicable, from the project site and all disturbed areas of the construction site that have not been stabilized.

Disturbed areas and areas used for storage of materials exposed to precipitation shall be inspected for evidence of, or potential for pollutants entering the storm water management system. The SWM system and erosion and sedimentation control measures shall be observed to ensure that they are operating correctly.

If corrective actions are necessary, it shall be recorded in the inspection report.

Inspection and maintenance reports shall be completed at least every week and following a rainfall event of 0.50 inches or greater (see attached form). A copy will be kept in a file on site.

SECTION 5

NON-STORM WATER DISCHARGES

Dewatering for underground facilities installation, hydrostatic test water, and pavement wash waters, will be detained on site within small impoundments and may discharge from the site. Any discharge from the site will require filtration and treatment prior to entering the off site conveyance system and shall meet the requirements of the permits for stormwater discharge and dewatering activities for the site.

Spill reporting for items such as oils, fuel, etc. shall meet federal, state, and local requirements. Clean up and disposal of all spills shall meet the applicable regulatory agency requirements and shall be handled and disposed of as required.

STORM WATER POLLUTION PREVENTION PLAN

Cape Canaveral Energy Center

INSPECTION AND MAINTENANCE REPORT FORM

This form to be completed every 7 days and within 24 hours of a rainfall event of 0.50 inches or greater. Copies of these forms shall be retained for a period of at least 3 years.

CONTRACTOR:_____ DATE:_____

CONTRACTOR'S REPRESENTATIVE:_____

OWNER'S REPRESENTATIVE:_____

Days since last rainfall:_____

Amount this period:_____

SEDIMENTATION AND EROSION CONTROLS:

Temporary Stabilization Controls:_____

_____

_____

Permanent Stabilization Controls:_____

_____

_____

Inlet Protection:_____

_____

_____

Outfall Protection:_____

_____

Silt fences:_____

_____

_____

Construction Entrances:_____

_____

Maintenance required for sediment control:_____

To be performed by:_____

On or before:_____

MATERIALS MANAGEMENT PRACTICES:

Evidence of spills:_____

Maintenance required for materials management areas:_____

To be performed by:_____

On or before:_____

CHANGES REQUIRED TO THE POLLUTION PREVENTION PLAN:

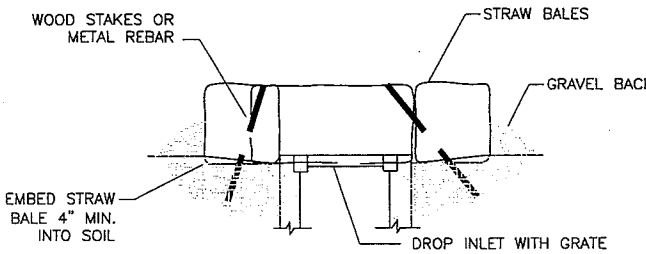
REASON FOR CHANGE:_____

CONTRACTOR'S REPRESENTATIVE:

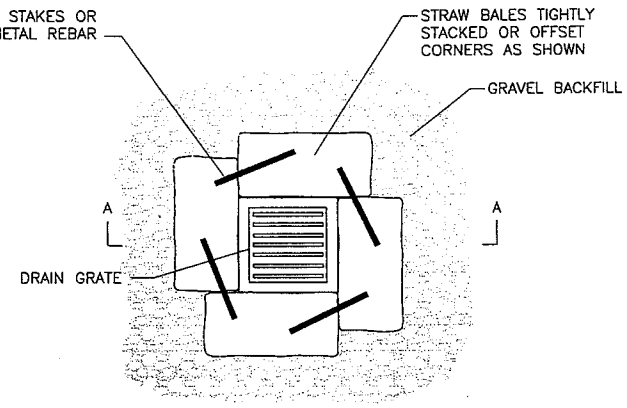
Signed:_____ Date:_____

OWNER'S REPRESENTATIVE:

Signed:_____ Date:_____



SECTION A–A



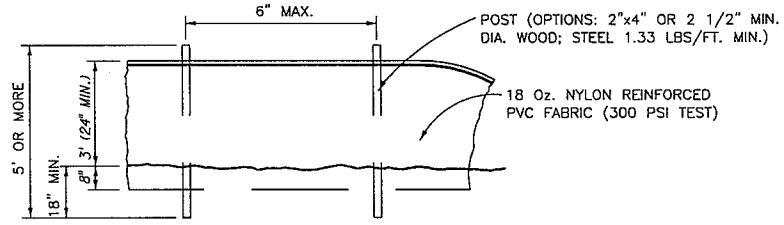
PLAN VIEW

NOTES:

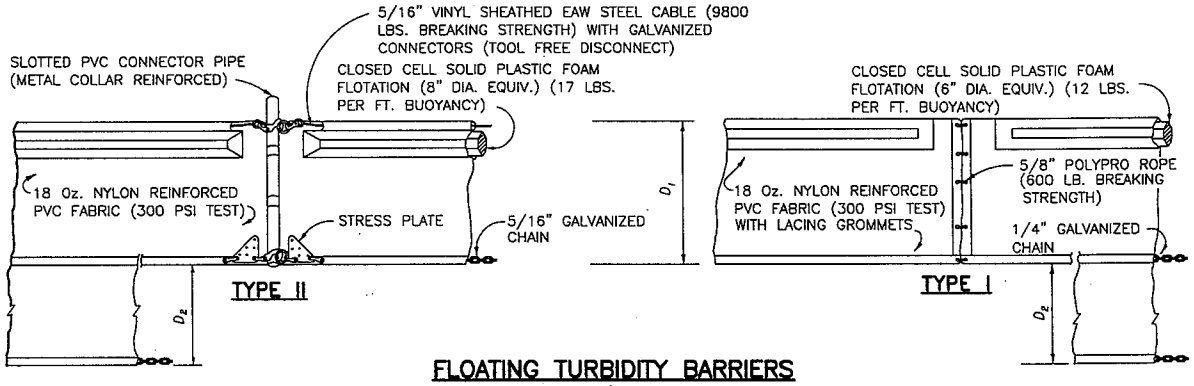
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EMBED THE STRAW BALES 4" INTO THE SOIL AND OFFSET CORNERS OR PLACE BALES WITH ENDS TIGHTLY ABUTING. GRAVEL BACKFILL WILL PREVENT EROSION OR FLOW AROUND THE BALES.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BY–PASSING THE INLET. EXCAVATION OF A BASIN ADJACENT TO THE DROP INLET OR A TEMPORARY DIKE ON THE DOWNSLOPE SIDE OF THE STRUCTURE MAY BE NECESSARY.
4. PLACE AROUND ALL CONSTRUCTED INLETS DURING CONSTRUCTION.

INLET PROTECTION – HAY BALES AND GRAVEL PLAN

N.T.S.



STAKED TURBIDITY BARRIER



FLOATING TURBIDITY BARRIERS

n.t.s.

NOTES:

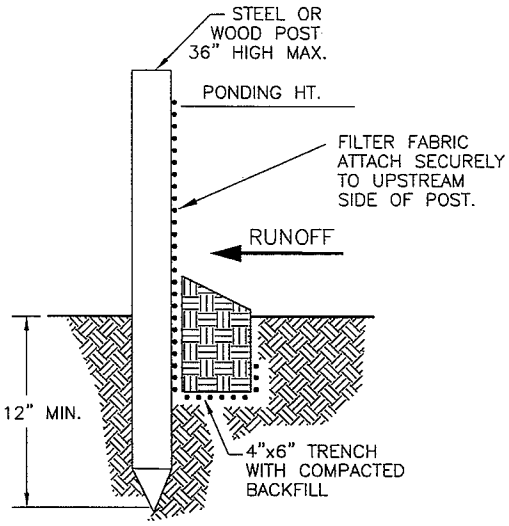
D_1 = 5' STD. (SINGLE PANEL FOR DEPTHS 5' OR LESS)
D_2 = 5' STD. (ADDITIONAL PANEL FOR DEPTHS > 5')
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET. TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER.

COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE EMPLOYER.

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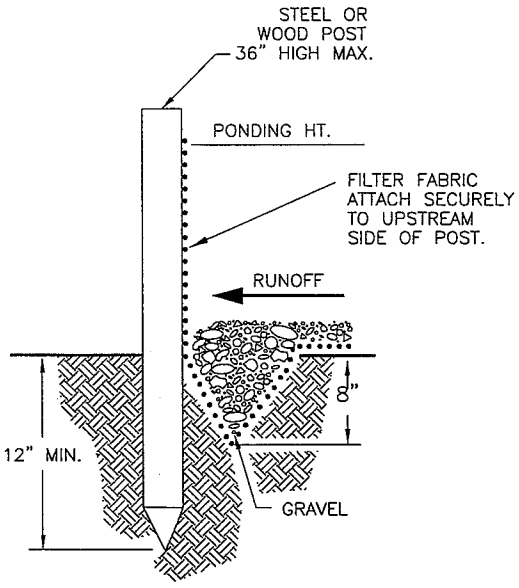
CAPE CANAVERAL ENEGRY CENTER	BEC PROJECT NO.	FIGURE
SWPPP DETAILS	17213/60061022	A

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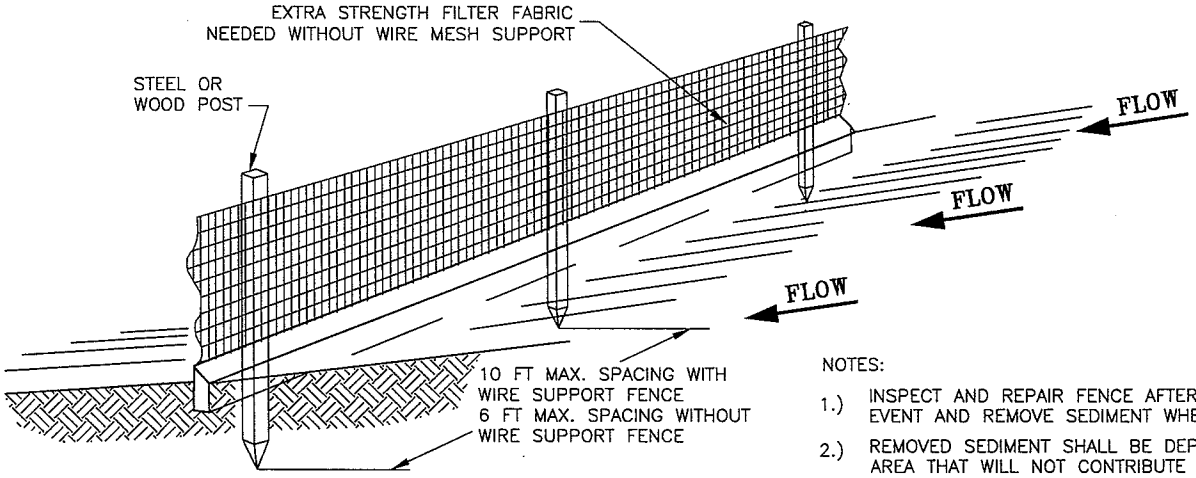
STANDARD DETAIL

TRENCH WITH NATIVE BACKFILL



ALTERNATE DETAIL

TRENCH WITH GRAVEL



NOTES:

1.) INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.

2.) REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

3.) SILT FENCE SHALL BE PLACED ON SLOPE CONTOUR TO MAXIMIZE PONDING EFFICIENCY.

4.) OVERLAP ALL JOINTS AT LEAST 6 FEET.

SILT FENCE DETAILS

N.T.S.

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CAPE CANAVERAL ENEGRY CENTER

SWPPP DETAILS

BEC PROJECT NO. 17213/60061022

FIGURE B

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DHR RESPONSES

DIVISION OF HISTORICAL RESOURCES COMMENTS

DHR – A.a. A review of the application and our files indicates that the immediate FPL Cape Canaveral Energy Center (CCEC) property and two adjacent construction lay down areas to the west were subjected to limited cultural resource investigations in 2008 by Janus Research of Tampa, Florida for Golder Associates. Only the CCEC plant survey was submitted to this office prior to receipt of the reference application. No cultural resources (archaeological sites, buildings or structures) were identified within the CCEC or lay down areas. It is the opinion of this agency and we concur with the findings of Janus Research that it is unlikely that significant cultural resources will be encountered within the CCEC area of potential affect as was defined in their survey coverage. However, the area of potential effect did not address indirect affects – such as noise, lights and emissions - to cultural resources within a 1-mile radius from the CCEC site; nor possible deeply buried cultural deposits that the standard archaeological field methodology will not discover. We request that the applicant address any potential indirect affects; and develop and present an unexpected cultural resource discoveries training plan for demolition and construction contractors and project managers for review and approval by this agency.

RESPONSE: With the assistance of Golder/Janus Research, FPL has conducted an indirect effects evaluation for the CCEC Project. Although DHR initially requested an indirect effects evaluation within a 1- mile radius of the CCEC site, based on a teleconference call between DHR, Golder, and Janus Research on February 16, 2009, DHR agreed that an analysis of a 1/2-mile radius of the CCEC site for indirect effects would be adequate since the proposed stacks would be lower in height than the current ones and, therefore, would result in a positive visual change.

The methodology in conducting this evaluation was coordinated with DHR and consisted of two phases: 1) Janus Research would conduct a field investigation to evaluate the potentially eligible, eligible, or National Register of Historic Places (National Register)-listed buildings within a 1/2-mile radius of the CCEC site (based on the location of the three proposed exhaust stacks); and 2) Janus Research, with the assistance of Golder and FPL, would evaluate the potential affects (i.e., such as noise, lights, and emissions) of the CCEC Project to the identified buildings, if needed. As discussed below, Janus Research did conduct a field investigation, including performing a background research. The results of the evaluation determined that no potentially eligible, eligible, or National Register-listed buildings were identified within the 1/2-mile radius of the CCEC site that could potentially be indirectly affected. Therefore, no additional analyses were performed.

Prior to conducting the reconnaissance survey fieldwork, background research was performed that included a review of Florida Master Site File (FMSF) and GIS data. No previously recorded historic resources were revealed during the background research. In addition, historic aerials of the survey area dating from 1951 were compared to the current aerials in order to form an impression of the properties and development from the historic period in comparison to the present day. These aerials reveal that development was sparse in the area as of 1951; a few scattered buildings sited along U.S. Highway 1 are visible on the historic aerials.

Subsequently, an architectural historian and technician conducted a historic resources reconnaissance survey for an area of ½-mile-radius from the CCEC site in order to identify and document historic resources that are eligible for inclusion in the National Register or currently listed in the National Register. The reconnaissance survey involved a visual inspection of all built resources within the 1/2-mile radius from the CCEC site. A significant portion of the eastern area within the 1/2-mile radius is the Intracoastal Waterway. The remaining survey area is characterized by primarily non-historic properties that include commercial and residential buildings. A non-historic cemetery is

located in the southwestern portion of the survey area. A few modified historic buildings were located within the survey area, but their historic physical integrity was compromised by alterations and they were not sited in a contiguous area, which would comprise a potential historic district. No National Register-eligible or listed historic resources, including historic districts, were identified during the reconnaissance survey.

The findings of the indirect effects evaluation (e.g., field notes, photos, and conclusions) were submitted to DHR on March 10, 2009, for review and determination and are presented in Attachment DHR-A.a.

An Unanticipated Discovery Plan and Contractor Training will be prepared in coordination with DHR prior to starting demolition.

DHR – A.b. In addition, we request that the two lay down properties be subjected to standard archaeological field investigations, including subsurface testing.

We note that U.S. Highway 1 parallels the western boundary of the CCEC plant property. Any alterations or changes to the linear roadway resource must be addressed in a supplemental cultural resource assessment.

RESPONSE: With assistance from Golder/Janus Research, FPL conducted a standard archaeological field investigation, including subsurface testing for the construction laydown area west of U.S. Highway 1 that meets the requirements of Chapter 1A-46. The results of the evaluation determined that no archeological materials were identified. The findings from the evaluation (e.g., field notes, photos, and conclusions) were submitted to DHR on March 10, 2009, for review and determination (see Attachment DHR-A.a).

Upon determination of final plans and if roadway improvements on U.S. Highway 1 are required as part of the CCEC Project, Golder/Janus Research will assist FPL in conducting the appropriate evaluation of cultural resources for the necessary roadway improvements.

DHR – A.c. Lastly, if new transmission line corridors or replacement transmission lines will be constructed in association with the CCEC that have not previously been surveyed, they will need to be investigated to determine if cultural resources are present and if such resources could be adversely impacted.

RESPONSE: The Project does not involve any new offsite transmission line corridor. No replacement transmission lines will be constructed in association with the CCEC on property that has not previously been surveyed.

Attachment DHR-A.a

Cultural Resource Assessment Survey of the FPL Cape Canaveral Energy Center Project Brevard County

Prepared for:

Florida Power & Light
700 Universe Boulevard
Juno Beach, Florida 33408

In association with:

Golder Associates, Inc.
5100 West Lemon Street, Suite 114
Tampa, Florida 33609

Prepared by:

Janus Research
1300 North Westshore Boulevard, Suite 100
Tampa, Florida 33607

March 9, 2009

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INTRODUCTION

The cultural resource assessment survey (CRAS) of the Florida Power & Light Company (FPL) Cape Canaveral Energy Center Project in Brevard County, Florida was conducted for FPL and in association with Golder Associates. Janus Research surveyed the Cape Canaveral Energy Center (CCEC) site for direct effects in September 2008 (see Appendix A; DHR Project File No.: 2008-06618). Additional surveys of the proposed offsite construction laydown and parking area as well as an indirect effects evaluation were conducted in September 2008 and March 2009. The results of these surveys are included in this report to meet the requirements of Chapter 1A-46, (*Archaeological and Historical Report Standards and Guidelines*), *Florida Administrative Code*. The objective of the survey was to identify cultural resources within the area of potential effect and assess their eligibility for listing in the National Register of Historic Places (National Register).

The key environmental approval will be Site Certification under Florida's Power Plant Siting Act (PPSA). The project requires issuance of an Air Construction Permit and modifications to the existing Industrial Wastewater (IWW) Facility Permit. Local approvals have been obtained for the project.

Accordingly, this assessment complied with Chapter 267, *Florida Statutes*; and the minimum field methods, data analysis, and reporting standards embodied in the Florida Division of Historical Resources' (FDHR) *Cultural Resource Management Standards and Operational Manual* (February 2003). All work conformed to professional guidelines set forth in the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716, as amended and annotated). Principal Investigators met the *Secretary of the Interior's Professional Qualification Standards* (48 FR 44716). Archaeological investigations were conducted under the direction of Kathleen Hoffman, Ph.D. Historic investigations were conducted under the direction of Amy Groover Streelman, M.H.P.

No archaeological sites or significant historic resources were identified within the direct or indirect area of potential effect.

Project Description

FPL plans to convert (i.e., modernize, repower) the Cape Canaveral plant into a modern, highly efficient, lower-emission, Next Generation Energy Center, using the latest combined cycle (CC) technology. The conversions will involve the dismantlement of the existing generation units, while leaving intact, certain components such as the cooling water intake and discharge infrastructure, and then the installation of the new CC generation unit. The Cape Canaveral plant will be named The Cape Canaveral Energy Center and is expected to have an in-service date of June 2013. As understood by FPL, the conversion will meet the Brevard County Performance Standards for noise, emissions, lighting, and vibration as identified in Chapter 62, Land Development Article VI Zoning Regulations, Division 6 Supplemental Regulations, Subdivision III Performance Standards.

The project area is located in Brevard County within Section 19 of Township 23 South, Range 36 East on the Sharpes (1949, PR 1980) USGS Quadrangle map (Figures 1-3) and consists of both the CCEC Site and Offsite Construction Laydown and Parking Area. Representative photographs are included in Appendix C.

- CCEC Site: Refers to the property on which both the existing Cape Canaveral plant is and where the converted plant will be located, comprising of approximately 43 acres in unincorporated Brevard County.
- Offsite Construction Laydown and Parking Area: Refers to approximately 40 acres of FPL-owned property located west of U.S. Highway 1 and adjacent to the existing FPL substation which will be used for a construction laydown and parking area during construction.

Area of Potential Effect

The Area of Potential Effect (APE) was determined by evaluating the improvements that will be implemented as part of the proposed project. The potential effects include both direct and indirect effects. For this project, the archaeological APE consisted of those areas of potential or likely ground disturbance. These areas included the footprints of the CCEC Site and Offsite Construction Laydown and Parking Area.

The APE for the historic resources survey considered both direct and indirect effects. The historic APE for direct effects included areas within the footprints of the CCEC Site and Offsite Construction Laydown and Parking Area. The APE for potential indirect effects was defined as the area within which potential visual effects for the improvements could be observed. It was defined in coordination with the FDHR based on the height of the highest stack associated with the proposed CCEC site. The new stacks will be approximately 150 feet in height, which is lower than the current 400 foot stacks. Also considered was the relatively flat topography of the surrounding area and the character of the built environment, which consists of one- to two-story commercial and residential buildings. Based on these factors, FDHR agreed on a ½ mile radius for indirect effects.

Please note that access roads and staging areas are assumed to be located within the boundaries of the project area. Should the project design change, a CRAS of these areas will be conducted if they fall outside of the project area.

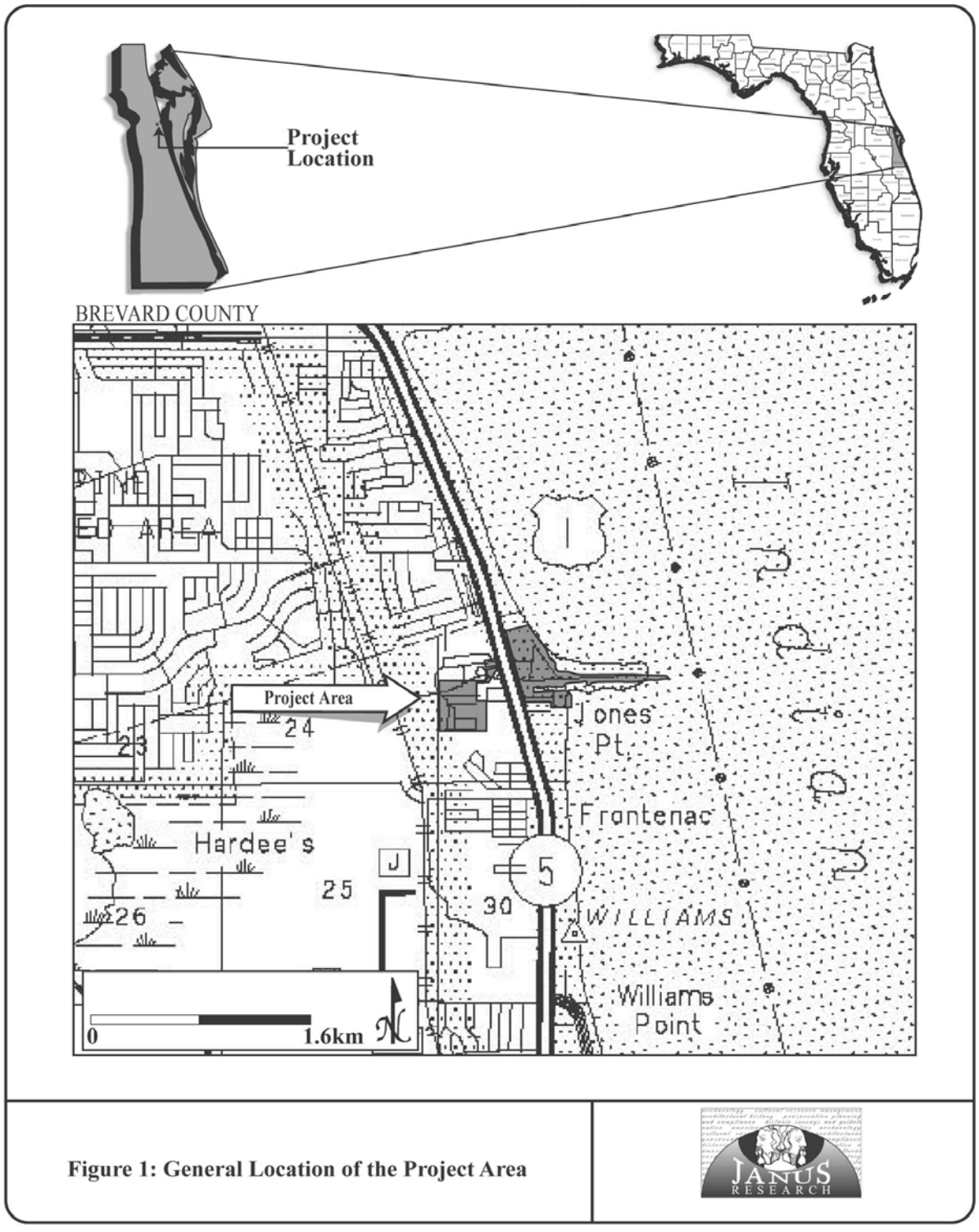


Figure 1: General Location of the Project Area

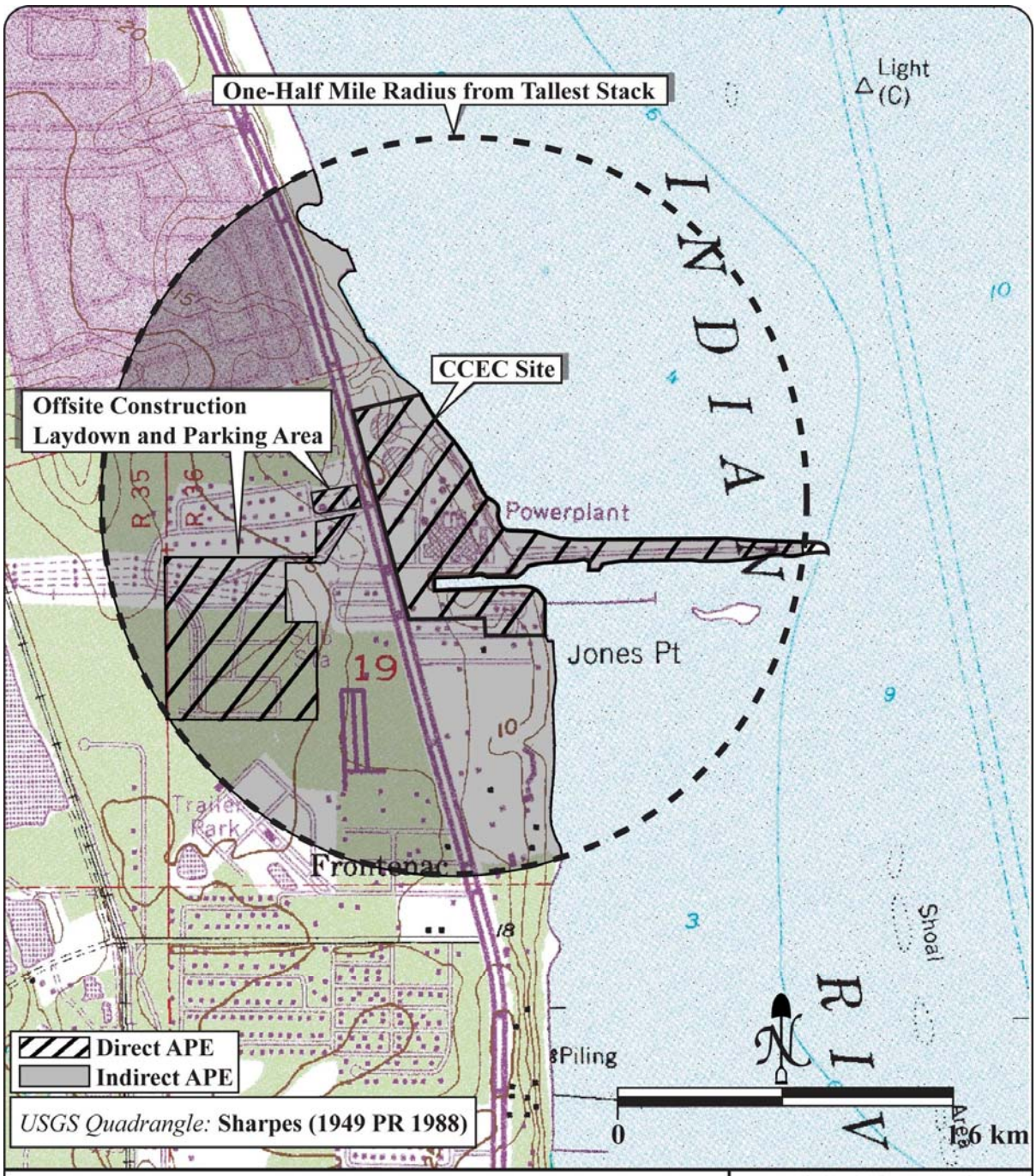


Figure 2: Area of Potential Effect Illustrated on USGS Quadrangle

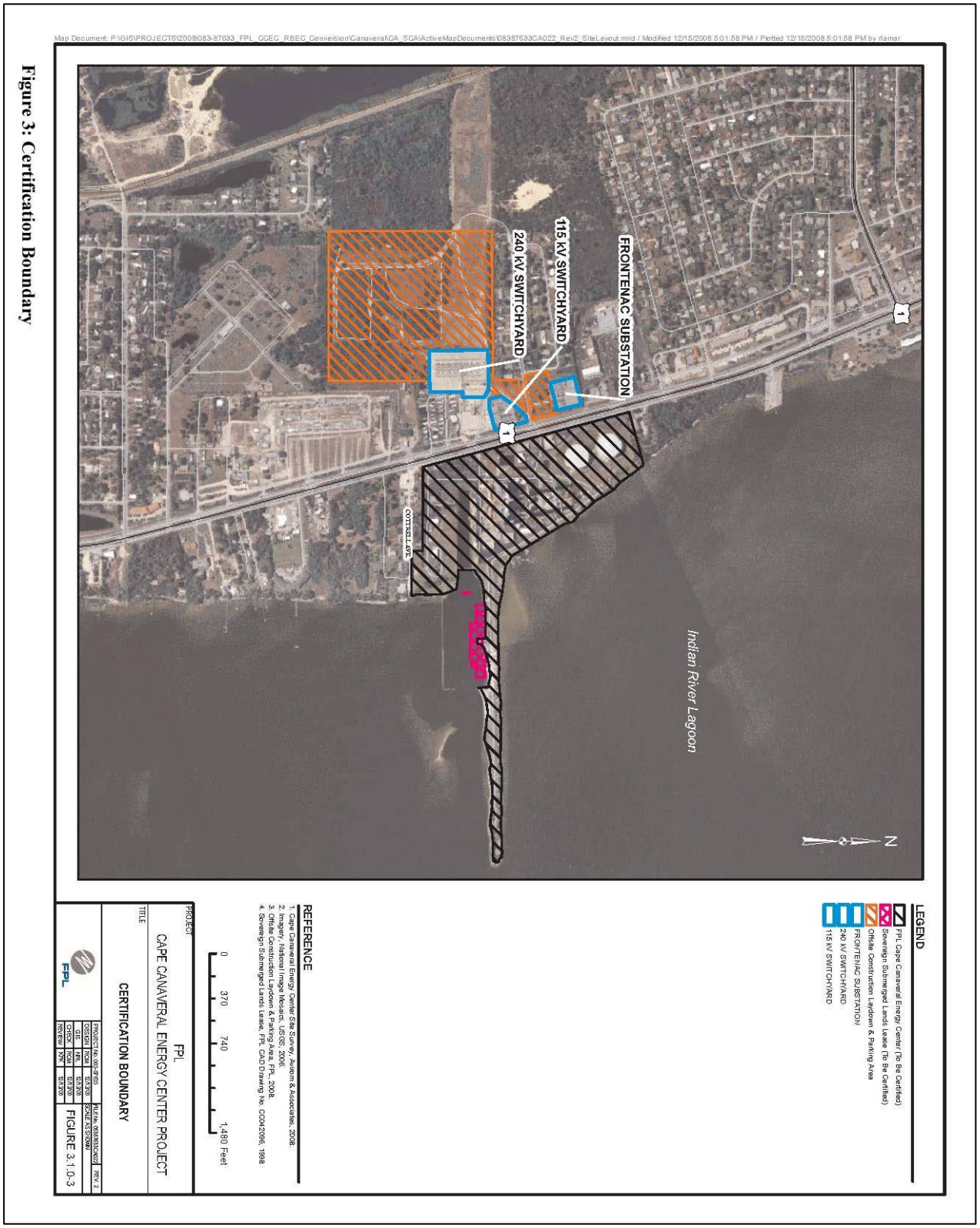


Figure 3: Certification Boundary

ENVIRONMENTAL SETTING

Environmental and ecological factors through time are used to reconstruct past conditions that influenced early human occupation of the project area, and so are included in this study.

Paleo-Environment and Macro-Vegetational Change

Although a comprehensive paleoenvironmental reconstruction is beyond the scope of this report, a brief description of the large-scale climatic and hydrologic conditions that have occurred since 31,050 BC is provided. This description is drawn primarily from the work of W. A. Watts (1969, 1971, 1975, and 1980) and Watts and Hansen (1988). Carbone (1983) has promoted the reconstruction of local paleoenvironments, or small-scale environmental change, with an effort towards developing regional paleoenvironmental mosaic landscapes. Vegetation and animals (including humans) either adapt to local areas (micro-habitats) or move to preferred locations. The descriptions given here provide some indication of the ecological context of pre-Columbian groups at different times, in particular the environmental limitations.

Since the termination of the Pleistocene Epoch at the end of the Wisconsin glaciation, roughly 11,550 BC, Florida has undergone significant climatic and environmental change. Notable changes in climate and subsequently in flora and fauna required human groups to adapt to their surroundings. These adaptations resulted in cultural changes in their hunting/foraging strategies and seasonal migration patterns. Within the archaeological record, these changes can be observed by differences in settlement patterns, midden composition, refuse disposal patterns, and the kinds of stone tools or pottery made.

Although Florida was not glaciated, the glacial conditions associated with the Laurentide ice sheet affected the paleoclimates of Florida. Paleobotanical evidence suggests that between 31,050 and 11,550 BC, Florida was dry, windy, and cool (Whitehead 1973). By the early Holocene, roughly 11,550 BC, the climate in west-central Florida had warmed and it is likely that precipitation increased; as a result, the shallow, perched lake levels rose. After 3050 BC, the environment in central Florida began to take on a more modern appearance. Large stands of slash pine (*Pinus elliottii*) became established, probably at the expense of oak in the wetter, low-lying areas. Rainfall increased and sea level rose, creating wetter conditions.

The earliest inhabitants of Florida accessed a permanent water supply from a number of solution lakes and ponds and a seasonal water supply from perched water ponds. Shallow water ponds and rivers fed by the Floridan Aquifer were dry during this period due to insufficient rainfall and the depressed level of the Aquifer. Settlement appears to have been limited to areas around sinkholes that penetrated the Floridan Miocene age limestones (Clausen et al. 1975, 1979) or areas within the Central Gulf Coast Karst Region where both solution lakes and perched water were available (Dunbar and Waller 1983).

By 8050 BC, the previously dry perched water systems began to retain water for longer periods of time as precipitation increased. By 6550 BC, the water levels in the perched water systems approached modern levels; however, the level of the Floridan Aquifer remained

depressed due to lowered sea levels. By 4050 BC, the Floridan Aquifer reached modern levels (Dunbar 1982:98). This resulted in fresh water discharge from springs, and spring-fed rivers. Arid conditions caused many of the perched water ponds to dry; thereby, restricting potable water to the deeper springs, rivers, and sinkholes (Dunbar 1982:98).

Between 550 BC and AD 1700, the level of the Floridan Aquifer rose. This rise, in combination with higher than present rainfall conditions, probably resulted in seasonal flooding of low-lying regions (Dunbar 1982:102). Potable water was abundant during this period. It is likely that pre-Columbian site location at this time was more dependent on the proximity of plant and animal resources than on the availability of water.

The Holocene Climatic Optimum, a time of warmer and drier environmental conditions, occurred during the Middle Archaic period (5000 to 3000 BC). Pine species replaced oak as the dominant forest element (Watts 1975). This implies that the availability of acorns and the animals that fed on those acorns would have been more restricted. Water was more plentiful, but only in rivers and springs fed by the Floridan Aquifer or at sinkholes.

By Late Archaic times, the environment of the region approached present conditions. With the incipient development of the Everglades, Lake Okeechobee, Lake Kissimmee, swamps, wetlands, and other drainages, water was no longer the limiting factor to site and resource location. The choice of site location was probably more a matter of finding a reasonably dry spot rather than a nearby water supply (Almy 1976, 1978; Grange et al. 1979). Sea levels were still fluctuating, but were within one meter of current levels (Mörner 1969; Widmer 1983). Woodland Period culture groups exploited microhabitats that existed until modern logging, ranching, and land drainage practices were instituted.

Regional Environment

The project area is located in northeastern Brevard County within the Eastern Valley and Atlantic Coastal physiographic regions (White 1970:Plate I-B). The Offsite Construction Laydown and Parking Area is located within both these physiographic regions while the CCEC Site falls solely within the Atlantic Coastal physiographic region. The Eastern Valley is a broad, flat valley that extends from the Central and Northern Highlands east to the Atlantic Coastal Ridges, and from the St. Marys Meander Plain south to the Everglades. It ranges in elevation from 1–9 m (5–30 ft.) above mean sea level, with its highest point at its head west of Vero Beach in Indian River County. The presence of beach ridges within this plain indicates that the valley was a regressional or progradational beach ridge plain. The plain may date to the Pamlico period which occurred approximately 100,000 years ago (White 1970:93).

The Atlantic Costal Ridge is made up of both single and multiple instances of relict beach ridges and bars extending from the Florida-Georgia State boundary to Homestead. The ridge is wider to the north of Eau Gallie in Brevard County, thinning south of Eau Gallie, and widening again in Broward and Miami-Dade Counties. In the vicinity of the project area, the ridge is separated from the Indian River by the Eastern Valley. Again, the Atlantic Coastal Ridge is described as likely dating to the Pamlico period when sea levels would have been 30

ft. higher than their current level and located between one-half mile to one mile from the beach (White 1970:86).

Silicified limestone or chert often were exploited by prehistoric peoples as raw material sources for the manufacture of stone tools (Lane et al. 1980). No outcrops of these materials are located near the project area. The closest known chert outcrops are located to the west and include the Ocala Group and Upper Withlacoochee quarry clusters (Scott 1978; Upchurch et al. 1982). The Upper Withlacoochee cluster extends along the Withlacoochee and Upper Hillsborough Rivers to approximately the Hillsborough-Pasco County line. The quarries consist mainly of silicified Suwannee Formation limestone, although some limited Crystal River Formation materials are also included within the cluster. It contains numerous prehistoric quarry locations, many of which contain silicified coral. Many of these quarries are located in and around the Green Swamp area. The western portion of this cluster, near Wesley Chapel, is considered the most significant source of silicified coral in peninsular Florida (Upchurch et al. 1982:132).

The Ocala Group quarry cluster is composed of three Eocene Crystal River formation chert sources in south-central Florida. Chert, from these sources, tends to be fairly low-grade with abundant fossil inclusions and other imperfections. These materials often contain abundant quantities of fossil foraminifers, particularly the species *Lepidocyclina, Operculoides, and Nummulities* (Upchurch et al. 1982:59). Distinguishing between the various clusters is difficult without a sufficiently large sample for comparison; the term "Ocala group" silicified limestone will be used to identify any Eocene Formation silicified limestone artifact discovered during the survey. A specific Eocene Formation quarry cluster will only be identified if sufficient supporting evidence is present (i.e., the relative abundance of Orbitoid foraminifera).

Water resources consist of both ground and surface water. The principal groundwater aquifer is the Floridan, which occurs under artesian conditions with slowly permeable clays and sands forming a confining layer that effectively prevents the vertical movement of water from the surficial aquifer to the Floridan aquifer. Surface sand deposits contain the surficial aquifer, which is recharged through local rainfall. Because of low hydraulic gradients, movement of water within this zone is very slow. Water is discharged from the aquifer through several methods, including lateral seepage to a stream or lake, evapotranspiration, or movement downward to the Floridan aquifer, where sinkhole development has breached the underlying confining layer of clay (USDA 1974:4). Large quantities of surface water are available in numerous locations throughout the county. These sources include the St. Johns River, the numerous streams flowing from the Atlantic Coastal Ridge into Indian River, and the many lakes and wetlands that are part of the St. Johns River drainage system (USDA 1974:4).

PRECONTACT OVERVIEW

Paleoindian Period (12,000–7500 BC)

The earliest period of precontact cultural development dates from the time people first arrived in Florida. The greatest density of known Paleoindian sites in Florida is associated with the rivers of northern and north-central Florida where distinctive lanceolate projectile points and bone pins have been found in abundance in and along the Santa Fe, Silver, and Oklawaha Rivers (Dunbar and Waller 1983). The majority of these have been found at shallow fords and river crossings where Native Americans presumably ambushed Pleistocene mammals. The bones of extinct species such as mammoth, mastodon, and sloth are commonly found preserved in the highly mineralized waters of the area's springs and rivers. Despite early claims to the contrary, present evidence strongly supports the contemporaneity of Paleoindians and these extinct mammals.

The climate of Florida during the late Pleistocene was cooler and drier than at present, and the level of the sea was as much as 49 m lower (Milanich 1994:38–41). Rising sea levels are assumed to have inundated many coastal sites dating to the Paleoindian and Early Archaic periods (e.g., Ruppe 1980; Goodyear and Warren 1972; Goodyear et al. 1980; Dunbar et al. 1988). It is difficult to determine the dependence of Paleoindian groups on estuarine and littoral resources because little is known of these submerged archaeological sites.

The prevailing view of the Paleoindian culture, a view based on the uniformity of the known tool assemblage and the small size of most of the known sites, is that of a nomadic hunting and gathering existence, in which now-extinct Pleistocene megafauna were exploited. Settlement patterns were restricted by availability of fresh water and access to high-quality stone from which the specialized Paleoindian tool assemblages were made. Waller and Dunbar (1977) and Dunbar and Waller (1983), from their studies of the distribution of known Paleoindian sites and artifact occurrences, have shown that most sites of this time period are found near karst sinkholes or spring caverns.

The majority of Paleoindian sites in Florida consist of surface finds. The most widely recognized Paleoindian tool in Florida is the Suwannee point, typically found along the springs and rivers of northern Florida. Other points, including Simpson and Clovis points, are found in lesser numbers. Other Paleoindian stone tools are known from the Harney Flats site (Daniel and Wisenbaker 1987:41–97), the Silver Springs site in Marion County (Neill 1958), and other northern Florida sites (Purdy 1981:8–32). These Paleoindian tools tend to be unifacial and plano-convex, with steeply flaked, worked edges (Purdy and Beach 1980:114–118, and Purdy 1981). Bifacial and "hump-backed" unifacial scrapers, blade tools, and retouched flakes, including spokeshaves, have been found at these sites (Purdy 1981; Daniel and Wisenbaker 1987:62–81, 86–87). However, some tools are little more than flakes or blades that were struck from cores, used, and discarded (Milanich 1994:51).

Archaic Period (7500–500 BC)

The Archaic period of cultural development was characterized by a shift in adaptive strategies stimulated by the onset of the Holocene and the establishment of increasingly modern climate and biota. It is generally believed to have begun in Florida around 7500 BC (Milanich 1994:63). This period is further divided into three sequential periods: the Early Archaic (7500–5000 BC), the Middle Archaic (5000–3000 BC), and the Late Archaic (3000–500 BC). The Late Archaic is subdivided into the Preceramic Late Archaic (3000–2000 BC) and the Orange Period (2000–500 BC).

Early Archaic (7500–5000 BC)

Cultural changes began after about 8000 BC in the late Paleoindian times with the onset of less arid conditions, which correlates with changes in projectile-point types, specifically a transition from lanceolate to stemmed varieties. Beginning about 7500 BC, Paleoindian points and knives were replaced by a variety of stemmed tools, such as the Kirk, Wacissa, Hamilton, and Arredondo types (Milanich 1994:63).

Kirk points and other Early Archaic diagnostic tools are often found at sites with Paleoindian components, suggesting that Early Archaic peoples and Paleoindians shared similar lifeways (Daniel and Wisenbaker 1987:33–34). However, it appears that the distribution of Early Archaic artifacts is wider than that of Paleoindian materials. Sites having both Paleoindian and Early Archaic components have been found to be largely restricted to natural springs and the extensive perched water sources of northern Florida.

With the wetter conditions that began about 8000 BC and the extinction of some of the Pleistocene animal species that helped to sustain earlier populations, Paleoindian subsistence strategies were no longer efficiently adapted to the Florida environment. As environmental conditions changed, surface water levels throughout the state increased and new locales became suitable for occupation. Early Archaic peoples might be viewed as a population changing from the nomadic Paleoindian subsistence pattern to the more sedentary coastal- and riverine-associated subsistence strategies of the Middle Archaic period.

Middle Archaic Period (5000–3000 BC)

Throughout the Middle Archaic, environmental and climatic conditions would become progressively more like modern conditions, which would appear by circa 3000 BC. During this period, rainfall increased, surface water became much less restricted and, as a result, vegetation patterns changed. The Middle Archaic period is characterized by increasing population and a gradual shift toward shellfish, fish, and other food resources from freshwater and coastal wetlands as a significant part of their subsistence strategy (Watts and Hansen 1988:310; Milanich 1994:75–84). Pollen evidence from Florida and south-central Georgia indicates that after about 4000 BC, a gradual change in forest cover took place, with oaks in some regions giving way to pines or mixed forests. The vegetation communities that resulted from these changes, which culminated by 3000 BC, are essentially the same as those found in historic times before widespread land alteration took place (Watts 1969, 1971; Watts and Hansen 1988).

The Middle Archaic artifact assemblage is characterized by several varieties of stemmed, broad-blade projectile points. The Newnan point is the most distinctive and widespread in distribution (Bullen 1975:31). Other stemmed points of this period include the less common Alachua, Levy, Marion, and Putnam points (Bullen 1968; Milanich 1994). In addition to these stemmed points, the Middle Archaic lithic industry, as recognized in Florida, includes production of cores, true blades, modified and unmodified flakes, ovate blanks, hammerstones, "hump-backed" unifacial scrapers, and sandstone "honing" stones (Purdy 1981; Clausen et al. 1975). Additionally, thermal alteration, a technique in stone tool production, reached its peak during the Middle to Late Archaic periods.

Three common types of Middle Archaic sites are known in Florida (Bullen and Dolan 1959; Purdy 1975). The first are small, special-use camps, which appear archaeologically as scatters of lithic waste flakes and tools such as scrapers, points, and knives. These sites are numerous in river basins and along wetlands and probably represent sites of tool repair and food processing during hunting and gathering excursions (Milanich 1994:78). The second common site type is the large base camp. This type of site may cover several acres or more, and contains several thousand or more lithic waste flakes and tools. The third common type of site is the quarry-related site that occurs in localities of chert outcrops.

Middle Archaic sites are found in a variety of locations, including, for the first time, freshwater shell middens along the St. Johns River and the Atlantic Lagoon. Middle Archaic sites have been found in the Hillsborough River drainage northeast of Tampa Bay, along the southwestern Florida coast, and in South Florida locales such as Little Salt Spring in Sarasota County. In addition, Middle Archaic sites occurred throughout the forests of the interior of northern Florida (Milanich 1994:76).

Late Archaic Period (3000–500 BC)
After 3000 BC, there was a general shift in settlement and subsistence patterns emphasizing a greater use of wetland and marine food resources than in previous periods. This shift was related to the natural development of food-rich wetland habitats in river valleys and along the Atlantic and Gulf coasts (Bense 1994). By the Late Archaic period, a regionalization of precontact cultures began to occur as human populations became adapted to specific environmental zones. Based on current evidence, it appears that relatively large numbers of Late Archaic peoples lived in some regions of the state but not in others. For example, large sites of this period are uncommon in the interior highland forests of northwestern Florida and northern peninsular Florida, regions where Middle Archaic sites are common. The few Late Archaic sites found in these areas are either small artifact scatters or components in sites containing artifacts from several other periods. This dearth of sites in the interior forests suggests that non-wetland locales either were not inhabited year-round or were only inhabited by small populations (Milanich 1994:87).

Extensive Late Archaic middens are found along the northeastern coast inland waterway from Flagler County north, along the coast of southwestern Florida from Charlotte Harbor south into the Ten Thousand Islands, and in the braided river-marsh system of the central St. Johns River, especially south of Lake George. The importance of the wetlands in these regions to precontact settlements was probably duplicated in other coastal regions, especially

the Central Peninsular Gulf Coast and the Northwest (Milanich 1994:85). However, in many of these coastal areas, such as Tampa Bay, many of the Late Archaic sites are inundated (Warren 1964, 1970; Warren and Bullen 1965; Goodyear and Warren 1972; Goodyear et al. 1980).

Formative and Mississippian Periods (500 BC–AD 1513)

The Formative Period represents a time when changes in pottery and technology occurred throughout Florida. The specific changes in pottery traditionally used by archaeologists to mark the beginning of this period include the replacement of fiber-tempered pottery with sand-tempered, limestone-tempered, and chalky-paste ceramics. Three different projectile point styles (basally-notched, corner-notched, and stemmed) also occur in some areas in contexts contemporaneous with these new ceramic types. This profusion of ceramic and tool traditions suggest population movement and social interaction between culture areas. The earliest known major occupations of southern Florida date to this period (Bullen et al. 1968; Sears 1982).

Mississippian cultural development began in the central Mississippi Valley around AD 750 and was adopted by cultures in Florida between AD 800 and AD 1000. It was characterized by elaborate community developments including truncated pyramidal mounds, large plazas, and a chiefdom-level of socio-political organization. Other distinctive traits include small, triangular-shaped projectile points, the use of the bow, religious ceremonialism, increased territoriality and warfare, and, in some areas, development of agriculture (Milanich 1994:355–412).

East and Central Cultural Region

East and Central Florida is a region composed of the lower and central portions of the St. Johns River, its tributaries, adjacent portions of the coastal barrier–salt marsh–lagoon system, and the Central Florida Lake District (Figure 4). These areas were occupied during the Formative period by what archaeologists call the St. Johns cultures. The early St. Johns I and II cultures developed out of the Orange culture of the Late Archaic period. In general, there was great continuity in this region from the time of the Orange Period peoples to the time of the various eastern Timucuan-speaking groups who lived there in the colonial period (Milanich 1994).

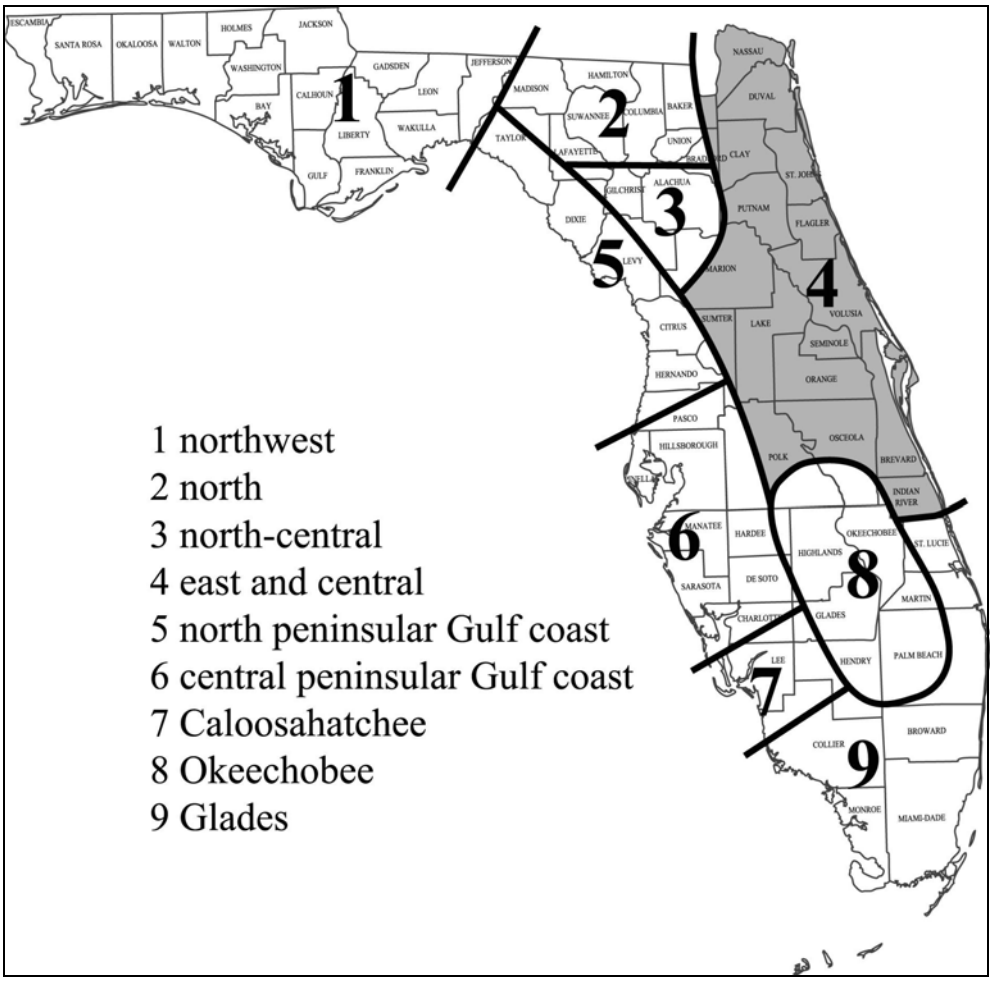


Figure 4: East and Central Culture Region

A chronology for the St. Johns culture sequence is shown in Table 1. The dates for these periods, it should be noted, correspond with other chronologies in northern Florida. This is due to shared traits among the groups of northern and eastern Florida. Primarily, ceramic changes, on which archaeologists base their chronologies, spread across northern Florida at approximately the same time. The same pre-Columbian developments that influenced other cultures in the Southeast also affected the St. Johns cultures (Milanich 1994).

Table 1. St. John's Region Chronology

Period	Dates
St. Johns Ia	AD 100 – AD 500
St. Johns Ib	AD 500 – AD 750
St. Johns IIa	AD 750 – AD 1050
St. Johns IIb	AD 1050 – AD1513
St. Johns IIc	AD 1513 – AD1565

Source: Milanich (1994)

Few St. Johns I period habitation sites have been extensively studied. However, evidence from several sites strongly suggest that year-round St. Johns settlements were present in the coastal zone and that such sites were often adjacent to special-use camps (Russo et al. 1989; Russo et al. 1992). The tools and other St. Johns I period artifacts associated with these sites were similar to those found associated with Orange Period sites. Examples include bone and shell tools, net weights, stone plummets, bottle gourd containers, distinctive chalky St. Johns ceramic wares, and occasional sand-tempered plain ceramics. Although surface decoration occurs on some of the St. Johns wares, the trend over time is for fewer decorated sherds during this period (Milanich 1994:257–264).

Sand burial mounds are present during the St. Johns I period, prior to AD 100. Goggin (1952) describes these mounds as low rises or truncated cones usually less than four feet high, although a few are almost 10 feet high. Deposits of red ochre or a similar mineral were often placed in these mounds. Primary flexed, extended, and secondary bundle interments are known in this period, the latter indicating the use of a charnel house (Milanich 1994:260).

After AD 100, new ideas appear to have entered the region along with exotic items. Such objects, placed in caches in mounds or with individual burials, included mica and galena, copper-covered animal bones, wooden effigies, greenstone celts, quartz plummets, copper discs, copper earspools, and effigy pipes. Locally made Dunns Creek Red and St. Johns Plain and St. Johns Check Stamped vessels were placed in the mounds (Milanich 1994:262).

The St. Johns Ia period mounds tended to be larger than those of the earlier St. Johns I period, and all are constructed in the shape of truncated cones. In later mounds of this period, Swift Creek Complicated Stamped vessels are also found. Log tombs containing numerous burials were found in two St. Johns Ia period sites (Bullen et al. 1967; LaFond 1972, 1983).

During the St. Johns Ib period, the diffusion of Weeden Island rituals and beliefs into the region is reflected in the types of exogenous ceramics found in the mounds. Additionally, some mounds contain vessels made with St. Johns chalky paste but in Weeden Island shapes and decorated with Weeden Island motifs. These copies of Weeden Island vessels sometimes depict animals, such as a duck effigy and other ceramics found in a mound at Tick Island (Goggin 1952:100; Moore 1894a: 58–63). By the end of the St. Johns Ib period, circa AD 750, native groups were living in villages and practicing horticulture, as was common throughout Florida at this time (Milanich 1994:262).

The appearance of St. Johns Check Stamped pottery marks the beginning of the St. Johns IIa period. Although significant continuity exists between the St. Johns I and II periods, there is an increase in the number of sites or St. Johns II components within sites. Population increases in at least some locales within the St. Johns drainage resulted in the development of a more complex socio-political organization, much like that of contemporary Mississippian cultures to the north and northwest. There is evidence that at least one of the St. Johns IIb period mound sites interpreted as the center of a chiefdom was still occupied when European influences first reached Florida (Milanich 1994:263).

Subsistence practices among the St. Johns II peoples were very similar to those of the St. Johns I period. Evidence from two St. Johns IIb sites provided evidence of the use of maize, gourds, squash, acorns, hickory nuts, cabbage palm, may pop, grape, and saw palmetto, among other plants (Newsom 1986, 1987; Purdy 1991). Faunal samples from excavations at Hontoon Island (Wing and McKean 1987) were dominated by freshwater species such as snail, catfish, gar, bass, mullet, aquatic turtle, and alligator, as well as terrestrial species such as ducks, geese, gopher tortoise, rabbit, deer, and turkey. Most popular in the meat diet were freshwater snail, catfish, pond turtle, and gopher tortoise. All of the latter species could be taken with simple and efficient technologies: gathering snails and gopher tortoises by hand, using hook and line or nets for catfish, and catching turtles with traps or by hand (Milanich 1994:266).

Archaeological evidence does suggest that Mississippian cultures did have some influence on St. Johns IIb peoples, and some artifacts similar to those from Mississippian mounds have been recovered from sites in the St. Johns region during this period (Moore 1894a, 1894b; Brown 1985). Artifacts recovered from such mounds have included "killed" *Busycon* shells, greenstone celts, spatulate greenstone celts, ceramic biconical tubes, ceramic plant and animal effigy vessels, a limestone earspool with copper sheeting, a copper breast plate with "forked eye" motifs, a large wooden owl carving, and wooden carvings of an otter and a pelican (Moore 1894a; Bullen 1955:61; Purdy 1991:110, 119–120).

HISTORICAL OVERVIEW

The intent of this section is to identify the possible locations of any historic sites within the project area and to provide a background for the determination of their historical potential. To this end, books, maps, and manuscripts located at the Florida Department of Environmental Protection, Division of State Lands, and the library at Janus Research were examined.

European Contact and Colonial Period (ca. 1513–1821)

The arrival of the Spanish during the early 1500s initiated a period of profound social and cultural upheaval among the indigenous cultures inhabiting the state. Many traditional ways of life were destroyed or abandoned, while the remaining cultures were modified by the acquisition of Spanish traits and adaptation to the presence of a new and dominant culture.

The earliest contact between the native populations and the Europeans consisted of slave hunting expeditions. "Slaving expeditions," which provided workers for the mines of Hispaniola and Cuba, were not recorded in official documents as the Spanish Crown prohibited the enslavement of Caribbean natives. Evidence of these slave raids comes from the familiarity with the Florida coast stated by navigators of the earliest official coastal reconnaissance surveys (Cabeza de Vaca 1542: Chapter 4). The hostile response of the native population to expeditions during the 1520s may confirm this hypothesis.

Official credit for the European discovery of Florida belongs to Juan Ponce de León, whose voyage of 1513 took him along the eastern coast of the peninsula. He is believed to have sailed as far north as the mouth of the St. Johns River before turning south, stopping in the Melbourne Beach area in April of that year. The expedition then sailed southward, to Biscayne Bay and followed the Florida Keys, making contact with the local Tequesta people en route before turning to the northwest, where they encountered the Calusa people along the southwestern Gulf Coast. Other Spanish explorers followed Juan Ponce de León, and over the next 50 years, the Spanish government and private individuals financed expeditions hoping to establish a colony in "La Florida" (Tebeau 1971:21).

Three Native American ethnic groups inhabited eastern central Florida at the time of Spanish contact: the Ais, the Mayaca, and the Jororo. The Ais lived along the Atlantic Coast and were closely involved with the Spanish. They inhabited the coastal strand and Indian River areas at this time. They apparently mixed the indigenous hunting/gathering/fishing economy with the salvaging of Spanish shipwrecks (Milanich 1994:64–65). The Mayaca and Jororo peoples occupied an area from north central Florida to as far south as Lake Okeechobee (Mitchem et al. 1998).

The Ais lived under a chiefdom, consisting of towns with individual leaders who were all under the control of a paramount chief referred to as Ais (Milanich 1995:66). The main town of the Ais was located on the barrier island a little to the north of the Fort Pierce Inlet in Indian River County. This town was known as "Ais" during early Spanish contact. However,

Jonathan Dickinson, an Englishman who stopped briefly among the Ais in 1696, called the main Ais town Jece (Andrews and Andrews 1985).

In 1565, King Philip II of Spain licensed Pedro Menéndez de Avilés to establish a settlement in St. Augustine, Florida. Between 1565–1566, Menéndez sailed along the Florida coast placing crosses at various locations and leaving Spaniards "of marked religious zeal" to introduce Christianity to the Native American people (Gannon 1965:29). Settlements with associated missions were established at St. Augustine, San Mateo (Ft. Caroline) and Santa Elena, and smaller outposts and missions were located in Ais, Tequesta, Calusa, and Tocobaga territory (Gannon 1965:29).

The Mayaca people, along with the Jororo, were first mentioned in Spanish documents from the 1560s; Franciscan friars were working among them as early as the 1590s, but a formal mission was not established until about 1655 (Mitchem et al. 1998). It appeared on the 1655 list of missions as San Salbador de Mayaca (Hann 1996:178). In 1689, a mission to the Mayaca was listed as San Antonio de Mayaca, which consisted of a population of 30 families (Hann 1996:264). The Mayaca people were listed as part of the "Province of Timuqua," although there is solid evidence that the Mayaca were not Timucua-speakers, but spoke their own language (Hann 1996:264). The Jororo people, also Mayaca-speakers, apparently did not occupy the region until the late 1600s (Hann 1996:244; Mitchem et al. 1998).

In 1567, Brother Francisco Villareal was sent to one of the large Tequesta villages located on Biscayne Bay. In 1568, a skirmish between the Spanish soldiers and the Tequesta Indians temporarily closed the mission. By the end of 1568, the Tequesta were willing to reopen the mission, largely due to the work of Don Diego, a Tequesta who had visited Spain. Despite zealous attempts, the native groups in Florida continued to resist conversion and in 1572 Jesuit authorities decided to abandon their missionary efforts in Florida.

Undaunted, Menéndez turned his attention to another order, the Franciscans, and entreated them to send priests. The Franciscan mission effort was most successful in the northern areas of Florida. One possible reason may have been differences in Native American settlement patterns and economies among varying regions. According to Milanich (1978:68), the failure of the Spanish missions among the southern Florida native populations was due partially to the groups' subsistence pattern, which required seasonal movement for maximum resource exploitation. Consequently, for the remainder of the First Spanish period (1565–1763), the project area was virtually ignored as the Spanish concentrated their efforts in the northern half of the peninsula.

Another attempt to build a mission in southeastern Florida took place nearly 150 years after the establishment of St. Augustine. Because it was in Spain's best interest to maintain control along the Florida coastline and alliances with the native groups inhabiting the coast, a missionary effort was supported in the Biscayne Bay area (Parks 1982:55–65). Father Joseph María Monaco and Joseph Xavier Alaña were sent from Cuba in 1743, and arrived at a Native American village located at the mouth of the Miami River. The village did not appear any more receptive towards accepting Christianity than before. After Joseph Xavier Alaña conveyed this to the Governor of Cuba, the mission was closed, and the fort they had erected

was destroyed to prevent its fall into hostile hands (Parks 1982:55–65). Although the Spanish were resigned to the fact that missionization and settlement of southern Florida came at too high a price, they did strive to maintain good relations with the various native peoples who inhabited in the area.

The Ais population along the Indian River suffered a sharp decline in the early eighteenth century. One main reason for this decline is undoubtedly diseases introduced by Europeans. Another significant factor is related to the destruction of the Spanish mission system in northern Florida. The removal of this protective barrier allowed Creeks, Yamassee and other English-armed Indians uncontested access to almost all of Florida. The "English Indians" made frequent raids deep into southern Florida, killing many and carrying even more to Charleston where they were sold to the English as slaves (Hann 1991). By the time of the 1715 Spanish treasure fleet wreck, the Ais were barely in evidence. At this time, the Spanish encountered a small fishing party of Ais, and traded for insignificant amounts of fish and game (Dickel 1992). Because the drastically-reduced Ais population could offer little help to the treasure fleet wreck survivors, the governor at St. Augustine sent mission Yamassee and possibly Guali to forage for them (Burgess and Clausen 1982:46–57).

After this point, the Ais, like the Jobe and Jeaga to their south, largely disappear from recorded history. It is likely that they were virtually extinct or at least well on the way to extinction by the time the British took possession of Florida in 1763. Although Swanton (1946:85) suggests that the Ais may have taken refuge in southern Florida or fled to Cuba when the Spanish ceded Florida to Britain, to date no documents have been identified which specifically mention any people called "Ais" during this period.

The Seminoles, descendants of the Creek Indians, moved into Florida by the beginning of the eighteenth century to escape the political and population pressures of the expanding American colonies to the north. By this time, the Native American populations of Florida had begun to decline considerably because of disease, slave raids, intertribal warfare, and attacks from the Seminoles (Wright 1986:218). Sometime after 1701, British forces and their allies forced the remaining Mayaca and Jororo peoples into southern Florida or to the region around St. Augustine (Mitchem et al. 1998).

By the end of the eighteenth century, the Seminoles had become the dominant Native American group in the state. Groups of fugitive African-American slaves also had settled among the Seminoles by the early nineteenth century (Brown 1991:5–19). Armed conflict with pioneers, homesteaders, and eventually the U.S. Army resulted in the removal of most of the Seminoles from Florida. This action forced the withdrawal of the remaining Seminole population to the harsh environment of the Everglades and Big Cypress Swamp by the late nineteenth century.

The Territorial and Statehood Period (1821–1860)

In 1821, after several years of negotiations with Spain, the U.S. acquired Florida as a territory. The population of the territory at that time was still centered in the northern areas around Pensacola, St. Augustine, and Tallahassee. As more European-American settlers

moved into the region, conflicts arose with the Seminoles over available land. Pressure was brought to bear upon the government to remove the Seminoles from northern Florida and relocate them farther south. The Treaty of Moultrie Creek (1823) restricted the Seminole people to approximately four million acres of land in the middle of the state, running south from Micanopy to just north of the Peace River (Mahon 1967: Rear foldout map). This treaty was unpopular with the Seminoles, as they were reluctant to move from their established homes to an area they felt could not be cultivated. Equally unpopular were the later treaties of Payne's Landing (1832) and Fort Gibson (1833), which called for Seminole emigration to the western territories (Mahon 1967:75–76, 82–83). These treaties fostered Seminole resentment of settlers that would culminate in the Second Seminole War in 1835.

Mosquito Inlet provided a safe harbor and access to rich hammock lands for ambitious pioneers during the 1820s. The most notable newcomer to the Brevard County area was Thomas H. Dummett and his family. Dummett's oldest son, Douglas, introduced a new industry to the Indian River area when he planted large stands of citrus trees (Eriksen 1994:31). The Dummetts observed many wild citrus trees when they first settled, most of them having been spread by Native Americans and early Spanish settlers. Some, however, were the organized effort of Turnbull's colonists at New Smyrna during the British occupation (Rouse 1951:265–273). Through experimentation with grafting, along with the mild lagoon climate, Dummett's groves were able to survive the record-setting 1835 freeze that killed groves throughout the territory (Eriksen 1994:31). By 1865, Dummett's Indian River oranges were world famous. He began sharing his grafting and cultivation technology with many of the post-war settlers in the Indian River area and, by the late 1800s, his techniques had spread southward along the Indian River Lagoon. No individual has provided Brevard County with a more long-lasting and profitable enterprise (Eriksen 1994:33).

During the Second Seminole War, the area around Lake Tohopekaliga was a Seminole stronghold. They kept their cattle in the woods around the lake and retreated into the cypress swamp west of the lake at any approach of soldiers (Mahon 1967; Sprague 1964). Tohopekaliga means "Fort Site" and the lake was so named because the islands within the lake housed the forts and stockades of the Seminoles (Moore-Willson 1935:29).

In January of 1837, General Jesup's men encountered the Seminoles near the "Great Cypress Swamp." The soldiers drove the Indians into the swamp, across the "Hatcheelusteell" and into even more dense swamp (Sprague 1964:172). On January 28th, the army "moved forward and occupied a strong position on Lake Tohopekaliga, within a few miles of the point at which the Cypress Swamp approaches it, where several hundred head of cattle were taken" (Sprague 1964:172). Hetherington (1980:3), citing Major Edward Keenan, a "noted authority on the Seminole Wars," believes that General Jesup's base camp was located near the present-day Kissimmee Airport. The "Great Cypress Swamp" and "Hatcheelusteell Creek" referred to by Sprague (1964) are now called Reedy Creek Swamp and Reedy Creek (MacKay and Blake 1839; Mahon 1967: Rear fold out map; USGS Lake Tohopekaliga Quadrangle Map 1953; Hetherington 1980:3).

At the beginning of the Second Seminole War, the conflict was centered near the Withlacoochee region. In 1838, U.S. troops moved south to pursue the retreating Seminoles

into the Lake Okeechobee and Everglades regions. Colonel Zachary Taylor was sent to the area between the Kissimmee River and Peace Creek. Colonel Persifor Smith and his volunteers were dispatched to the Caloosahatchee River, and U.S. Navy Lt. Levi N. Powell was assigned the task of penetrating the Everglades (Mahon 1967:219–220). Powell's detachment had several skirmishes with Seminoles near Jupiter Inlet. Powell established a depot on the Miami River and erected Fort Dallas in the approximate location of present-day downtown Miami. For three months, Fort Dallas was a base of operations as Powell led his men into the Everglades in search of the Seminoles (Gaby 1993:47).

The Second Seminole War had a deleterious effect on new settlement in Florida. In an effort to expand Florida's frontier, the Armed Occupation Act of 1842 offered settlers 160 acres of land at no cost, provided they built a house, cleared five acres, planted crops, and resided on the land for five years. Any head of a family or single man over 18 years of age and able to bear arms was eligible to receive a homestead. This act, plus the end of the Second Seminole War, created a small wave of immigration by Anglo-American pioneers to central Florida. Most of these immigrants were Anglo-American farmers and cattle ranchers, or "crackers," from the southeast U.S.

Another result of the war was the creation of the Township and Range system when the first surveys of Florida began in 1835. Around this time, a trail linking military forts called the Hernandez Trail was opened and supply depots such as Fort Christmas and Fort Pierce were established (Eriksen 1994:28). A section of this trail ran through Brevard County approximately one half-mile west of present-day U.S. Highway 1. This trail, called the Hernandez Trail in honor of General Joseph Hernandez, was laid out in 1838 and extended for a distance of 25–30 miles from the Indian River to the headwaters of the St. Johns River.

An early steamboat, possibly the first to test the Indian River, was employed to transport troops south of Fort Pierce. Plans were suggested for a canal in place of the Haulover road, the ancient crossing of the Ais and Timucuan, to create a direct water route from Mosquito Lagoon to the Indian River Lagoon (Eriksen 1994:28).

The rapid growth of population in central Florida created the need for smaller political jurisdictions. In 1845, the same year that Florida was admitted into the Union, the poorly conceived name of Mosquito County was changed to Orange County. New boundaries were established to encompass present-day Seminole and Volusia Counties and parts of Brevard, Flagler, and Lake Counties (Historic Property Associates, Inc. 1995). In 1850, the population of the area that would later become Brevard County stood at 139. At the time of the census, the area was part of St. Lucie County; and in 1851, it became a part of Volusia County. On January 6, 1855, that portion of land stretching along the coast became Brevard County (Horton n.d.).

In December of 1855, the Third Seminole War erupted when Seminoles ambushed a small reconnaissance party commanded by Lieutenant George L. Harstuff near Fort Myers. Word of the massacre spread across the frontier, and the people of Volusia and Brevard Counties wanted to organize a mounted volunteer company for local protection. Their plans were still maturing when the Seminoles killed the Shine family near New Smyrna in December of

1856. However, the presence of the American military at the city of Enterprise and at Fort Capron convinced the Seminoles to confine their forays to the settlements near the Everglades. The war finally ended in 1858 when Chief Billy Bowlegs and 164 of his followers agreed to move west. As others soon followed, only a remnant of the Seminole nation remained in hiding in the impenetrable Everglades (Schene 1976:62).

Civil War and Post War Period (1860–1898)

With the beginning of the Civil War, cattle were needed to help feed the Confederate Army. Herds from as far south as central Florida were driven to railheads near the Georgia border. However, cattle ranchers discovered they could sell their herds in Cuba for more profit and began dealing with blockade-runners. The Union attempted to stop all shipping from Florida ports, but the blockade-runners were too abundant (Grismer 1949). On the eastern coast, Mosquito Inlet became widely known as an opportune place to penetrate the blockade. After the goods were landed, they could be transported overland to interior locations, largely without interference from Union troops (Schene 1976:67).

Titusville was founded in 1867 when Confederate Colonel Henry Theodore Titus stepped ashore on the banks of the Indian River, although the first U.S. Post Office in the area was established in 1859 in what was then known as Sand Point. Colonel Titus came to Sand Point with the idea of building a town on land overlooking the Indian River. Colonel Titus and his wife, Mary, built the first hotel and named it "The Titus House." The Colonel and Mary eventually donated land for the first courthouse and four local churches. They also laid out many of the town's streets, and established a link to the outside world by connecting the St. Johns and Indian Rivers with mule-drawn wagons (City of Titusville n.d.).

After the Civil War, emancipated African-Americans began to settle along the eastern coast of Florida. Among the first settlers of Melbourne in Brevard County were the Wright brothers, who established their homestead around 1877. The Wright Brothers House is a historic resource that was constructed circa 1892 in the Frame Vernacular style (Bureau of Historic Preservation n.d.:14).

Settlers who homesteaded the Indian River country during the late 1860s and 1870s relied on sailboats for supplies and outside contacts. However, by 1880, the population had grown so much that steamboat operators could make a profit. Between 1880 and 1899, more than 25 steamboat companies set up on the Indian River and brought dozens of steamers to Brevard County. The steamboat industry contributed much to the development of Brevard County by hauling finished lumber into the area for homes and transported the region's export crops to Titusville where they could then be moved by railroad to northern markets (Eriksen 1994:94–98).

By 1880, a small settlement named Melbourne had grown large enough to warrant its own post office. Established by Richard W. Goode on Crane Creek, the settlement was named after the hometown of C. J. Hector, a new resident from Australia. Hector was a store owner and county commissioner (Eriksen 1994:104). Dr. John Hawks wrote in *The East Coast of Florida* (1887) that Melbourne was a small village with a store or two and a couple of hotels.

In 1879–1880, George Barbour accompanied Senator Seth French on a tour of the southern and middle regions of Florida. Traveling by steamboat, the party made their way along the St. Johns River, arriving at Titusville and the Indian River. They visited Titusville, which at that time was county seat of Brevard County and was home to approximately 150 residents. Rockledge, which derives its name from a formation of coquina rock along the shore, came into existence in 1873 and is the oldest resort town on the East Coast. At the time of Barbour and French's visit, it had approximately 140 residents (Barbour 1964:30–37). As travelers such as Barbour returned to the North praising Florida's climate and hunting and fishing resources, more people began to visit the region. Many of them returned to settle land and build homes and farms.

In the 1880s, interest in the resources of southern Florida increased due to people like Hamilton Disston and Henry B. Plant. Disston, son of a wealthy Philadelphia industrialist, contracted with the State of Florida in two large land deals: the Disston Drainage Contract and the Disston Land Purchase. The Drainage Contract was an agreement between Disston and the State in which Disston and his associates agreed to drain and reclaim all overflow lands south of present day Orlando and east of the Peace River in exchange for one-half the acreage that could be reclaimed and made fit for cultivation.

Disston changed Florida from a wilderness of swamps, heat, and mosquitoes into an area ripe for investment. This enabled Henry B. Plant to move forward with his plans to open the western coast of Florida with a railroad-steamship operation called the Jacksonville, Tampa & Key West Railway. Through the Plant Investment Company, he bought up defunct rail lines such as the Silver Springs, Ocala & Gulf Railroad, Florida Transit and Peninsular Railroad, South Florida Railroad, and Florida Southern Railroad to establish his operation (Mann 1983:68; Harner 1973:18–23). In 1902, Henry Plant sold all of his Florida holdings to the Atlantic Coast Line, which would become the backbone trunkline of the southeast (Mann 1983:68).

During 1881 and 1882, channels were dug between the lake systems to the north and the Kissimmee River (Tebeau 1971:288). The Atlantic and Gulf Coast Canal and Okeechobee Land Company was responsible for opening up Lake Okeechobee to the Gulf of Mexico by dredging a channel to the Caloosahatchee River. Disston and his associates received 1,652,711 acres of land under the Drainage Contract, although they probably never permanently drained more than 50,000 acres (Tebeau 1971:280). Drainage operations began and the Florida Land and Improvement Company and Kissimmee Land Company were formed to help fulfill the Drainage Contract (Hetherington 1980:6).

Private land claims between 1881 and 1883 were probably squatters acquiring the land on which they lived prior to the land transfers under the Disston Land Purchase contract. The flurry of land transfers recorded in the early 1880s was mainly the result of two factors: large influxes of people during and as a result of railroad construction, and the widespread unpopularity of the Disston Land Purchase and Drainage Contract. Many residents resented the $0.25 per acre that Disston paid under the land contract, as they were required to pay $1.25 per acre under the terms of the Homestead Act of 1876. Claims also were made that Disston was receiving title to lands that were not swamplands or wetlands (Tebeau

1971:278). Many residents bought up the higher, better-drained parcels of land for speculation, knowing that the surrounding wetlands and flatwoods would be deeded to Disston under the Land Purchase contract. Many hoped that their more desirable land purchases would increase in value.

In August 1881, at the same time Disston's companies were beginning their work, the legislature granted a state charter to the privately owned Florida Coast Line Canal & Transportation Company to construct a continuous waterway from the St. Johns River to Miami; the intracoastal channel would provide a sheltered, inland passage for shallow-draft vessels. The charter granted the company 3,840 acres of land for every mile of canal built. Construction began in 1883 on a 5-foot-deep, 50-foot-wide, intracoastal channel connecting coastal bays, rivers, and lakes (Buker 1975:117). Although the canal company dredged almost continuously from 1883 until the 268-mile channel was completed in 1912, the firm's waterway operations were never successful. While the channel was still under construction, the company faced a formidable challenge from competing transportation interests expanding into South Florida (Buker 1975:120).

In Brevard County, B.C. Willard built the first house in Cocoa, which was originally known as Indian River City, in 1881–1882. Canaveral, settled in 1856 by Wilson and Barnham, had 30 to 40 families residing there by 1875. Pineda was settled in after 1880 and was originally called Hartland. During the 1890s, the community of Melbourne Beach was developed, and the Beaujean family built a bathhouse and small push-car railroad to the beach. On the riverside, a substantial pier was built near present-day Ocean Avenue pier to lure tourists and visitors from Melbourne (Thomas 1983:7, 20).

A list of owners of the land within the project site in the late 1880s and early 1900s obtained from the Florida Department of Environmental Protection (FDEP) Tract Book Records (n.d.) is included in Table 2.

Table 2. Land Apportionment within the Project Area

Township 23 South, Range 36 East			
Location	**Portion Owned**	**Owner**	**Date of Deed or Sale**
Section 19	Lot 1	United States of America	No Date Given
	Lots 2, 4, and 5	Hiram Hall	April 20,1883
	Lots 3 and 6	Mills O.B. Cottrell	September 13, 1915

The most influential developer of the eastern coast of Florida was Henry Morrison Flagler. A partner of John D. Rockefeller in the Standard Oil Company, he was already a wealthy man when he first visited Florida in 1878. During a visit in 1883, Flagler initiated his plans for an enterprise of new hotels and a railroad. His interest was first centered on the St. Augustine area, but he later expanded farther south. In February of 1893, Flagler's railroad arrived in Titusville, and by June of the same year, it was extended to Eau Gallie. By January of 1894, a person could travel the entire length of Brevard County by railroad (Tebeau 1971:284;

Hellier 1965:261). The establishment of Flagler's railroad system marked the end of the steamboat era, although at least 25 Indian River steamboat companies came into existence after 1893 (Hopwood 1986:46).

The railroad provided impetus to new commerce and trade. However, economic prosperity received a setback in December 1894 and February 1895 when Florida experienced two disastrous freezes that wiped out citrus and vegetable crops. Most of the groves along the Indian River were destroyed and some farmers never recovered and left the area.

Spanish-American War Period/Turn-of-the-Century (1898–1916)

At the turn-of-the-century, Florida's history was marked by the outbreak of the Spanish-American War in 1898. As Florida is the closest state to Cuba, American troops were stationed and deployed from the state's coastal cities. Harbors in Tampa, Pensacola, and Key West were improved as ships were launched with troops and supplies. Although short in duration, "The Splendid Little War" left its mark in the form of improved harbors, expanded railroads, and military installations (Miller 1990).

In 1900, George Washington Hopkins purchased 104,000 acres in Brevard County for his lumbering operations, and his Union Cypress Mill was located south of Crane Creek (Kjerulff 1972:14–15).

In 1904, Governor Napoleon Bonaparte Broward initiated significant reforms in Florida politics. Several of Broward's major issues included the Everglades drainage project, railroad regulation, and the construction of roads. During this time, railroads were constructed throughout the state and automobile use became more prevalent. Improved transportation in the state opened lines to export Florida's agricultural and industrial products. Between 1900 and 1910, the state population increased from 528,542 residents to 752,619. The creation of St. Lucie and Palm Beach Counties is a testament to the increasing volume of people moving to the east coast of the state (Miller 1990).

Rapid and widespread growth was the theme of this period in Florida history. Thousands of miles of railroad tracks were laid including the Florida East Coast, Atlantic Coast Line, and Seaboard Air Line railroads. While agriculture, especially the citrus industry, was the backbone of the Florida economy, manufacturing and industry grew during the beginning of the century. Fertilizer production, boat building, and lumber and timber products were strong secondary industries (Weaver et al. 1996:3).

Brevard County assumed its modern shape in 1905. By 1920, the county acquired many simple yet modern amenities, including the construction of water towers, sewer systems, and drainage districts involving systems of drainage canals and ditches. With the invention of the automobile and the subsequent development of a system for mass-production by Ford in 1913, George W. Hopkins, a resident of Eau Gallie, builder of the Union Cypress railroad and founder of the Union Cypress Company, became one of the first proponents of a dependable transportation route through western Brevard County. In 1916, Hopkins wrote to the county commissioners to advise them on the best route through his land for a highway to

St. Cloud. His foresight established the route of the Melbourne-Kissimmee highway, although it would be many years before this highway was operable and open to the general public (Eriksen 1994:148–150).

World War I and Aftermath Period (1917–1920)

The World War I and Aftermath period of Florida's history began with the U.S. entry into World War I in 1917. Wartime activity required several training facilities to be set up throughout the state. Protecting the coastlines was a priority at this time. Although the conflict only lasted until November of 1918, the economy was boosted by the war, especially shipbuilding. The war brought industrialization to port cities such as Tampa and Jacksonville, where ships were built. These cities also functioned as supply depots and embarkation points. An indirect economic benefit of the war was an increase in agricultural production such as beef, vegetables, and cotton (Miller 1990).

While Florida industrialization and agriculture flourished, immigration and housing development slowed during the war. Tourism increased, due to the war in Europe, which forced Americans to vacation domestically. Railroad construction resumed at the conclusion of the war. Tycoons such as Henry Flagler and Henry Plant were building the hotels and railroads for people desiring winter vacations in sunny Florida. These magnates took an interest in the promotion of and improvements in Florida in an effort to bring in more tourist dollars (Miller 1990).

Florida Boom Period (1920–1930)

After World War I, Florida experienced unprecedented growth. Many people relocated to Florida during the war to work in wartime industries, or were stationed in the state as soldiers. Bank deposits increased, real estate companies opened in many cities, and state and county road systems expanded quickly. Earlier land reclamation projects created thousands of new acres of land to be developed. Real estate activity increased steadily after the war's end and drove up property values. Prices on lots were inflated to appear more enticing to out-of-state buyers. Every city and town in Florida had new subdivisions platted and lots were selling and reselling for quick profits. Southeast Florida, including cities such as Miami and Palm Beach, experienced the most activity, although the boom affected most communities in central and southern Florida (Weaver et al. 1996:3).

Road construction became a statewide concern as it shifted from a local to a state function. These new roads made even remote areas of the state accessible and allowed the boom to spread. Apparently, up to 20,000 people were arriving in the state on a daily basis. Besides the inexpensive property, Florida's legislative prohibition on income and inheritance taxes also encouraged more people to move to the state.

By 1920, Brevard County population had increased to more than 8,500, a 90 percent rise from the 1910 figure of 4,717 people. In the same year, Melbourne had a population of 533 people. The improved road system brought an ever-growing procession of tourists into the county, and many of these tourists stayed to reside there. Brevard County's increasing

population and construction boom, which peaked in 1925, owed much to the promotional literature issued by government officials and private entrepreneurs. Any small town along the new highways provided a place to camp for the streams of tourists. One well-known campsite, the Midway Tourist Camp in Melbourne, maintained riverside cottages and tent/trailer spaces for approximately 800 guests (Eriksen 1994:163–164). Other developments included the surveying and incorporation of the Crane Creek Drainage District and Melbourne Tillman District. The Crane Creek Drainage District covered the lowlands west of Melbourne (Eriksen 1994:165).

In addition, a bridge crossing the Indian River, linking Titusville with Merritt Island, was constructed in 1922 as a result of a vote by North Brevard County property owners that supported a $175,000 bond issue to finance the construction. The bridge was built so property owners could travel easily to Cape Canaveral, the Atlantic Ocean beaches, and businesses on Merritt Island. This original structure was constructed of wood, and persons under eight were charged five cents to cross it, small vehicles were charged a toll of twenty cents, and animal driven vehicles were charged twenty-five cents. The bridge was named after Major John R. Walker, who initiated the campaign to build the structure.

The Boom period began to decline in August 1925, when the Florida East Coast Railway placed an embargo on freight shipments to southern Florida. Ports and rail terminals were overflowing with unused building materials. In addition, northern newspapers published reports of fraudulent land deals in Florida. In 1926 and 1928, two hurricanes hit southeastern Florida killing hundreds of people and destroying thousands of buildings. The collapse of the real estate market and the subsequent hurricane damage effectively ended the boom in southern Florida (Weaver et al. 1996:4). Many South Florida residents fled northward into Brevard County (Eriksen 1994:173). The recession was made worse by the 1929 Mediterranean fruit fly infestation that devastated citrus groves throughout the state (Weaver et al. 1996:4).

Despite these problems, communities with oceanfront casinos flourished in Brevard County. During the late 1920s, several airports or “landing fields” were established in Melbourne, Cocoa, and Titusville, primarily for the use of planes in the airmail service (Eriksen 1994:164). In 1928, the airfield at Melbourne was chosen as the site of the county’s first public airport. The choice was practical more than political; the Melbourne field was an ideal refueling spot for airmail flights, as it was midway between Jacksonville and Miami. At first, this airport was an open field with “MELBOURNE” painted on the roof of a nearby warehouse (Eriksen 1994:176).

By the time the stock market collapsed in 1929, Florida was already suffering from an economic depression. Construction activity halted and industry dramatically declined. Subdivisions platted several years earlier remained undeveloped and lots were occupied by partially finished buildings. While the national economy was in shock from the crash, however, Brevard County residents remained optimistic and did not seem to be immediately affected. In anticipation of an improved economy, local theater owners installed “phototone machines” in their movie houses so they could feature the first talking movies (Eriksen 1994:177).

Depression and New Deal Period (1930–1940)

As previously discussed, there were several causes for the economic depression in Florida, including the grossly inflated real estate market, the hurricanes, and fruit fly infestation. During the Great Depression, Florida suffered significantly. Between 1929 and 1933, 148 state and national banks collapsed, more than half of the state's teachers were owed backpay, and one in four residents was receiving public relief (Miller 1990).

As a result of hard economic times, President Franklin D. Roosevelt initiated several national relief programs. Important New Deal–era programs in Florida were the Civilian Conservation Corps (CCC), and the Civil Works Administration (CWA), later renamed the Works Progress Administration (WPA). The WPA provided jobs for professional workers and laborers, whose work included the construction or improvement of many roads, public buildings, parks, and airports in Florida. The CCC improved and preserved forests, parks, and agricultural lands (Miller 1990).

In 1933, the CWA began construction of the Melbourne Eau Gallie Airport, presently known as the Melbourne Regional Airport. Melbourne had been granted the right to build an airport on its northern boundary with Eau Gallie by the Legislature in 1929, and the CWA provided the laborers needed to clear saw palmettos from the site to create a landing field. In 1935, Federal funding was received for the project, 10 acres were cleared and planted with grasses provided by local homeowners, and a small hanger was built and boundary lights were installed. The new facility was considered one of the better airports on Florida's eastern coast and the WPA formally dedicated the Melbourne airport in 1937. It continued to receive funding for improvements such as the new radio towers installed in 1938. Several years later, the Navy announced plans to invest $3 million in the airfield to create the Melbourne Naval Air Station (Eriksen 1994:184–189).

Most of the state's economy was affected by the Depression. Beef and citrus production declined, manufacturing slowed, and development projects were stopped. Even the railroad industry felt the pressures of the 1930s; service was greatly reduced and personnel were laid off. In addition, the increasing use of the automobile lessened the demand for travel by rail. Despite the Depression, tourism remained an integral part of the Florida economy during this period. New highways made automobile travel to Florida easy and affordable and more middle-class families were able to vacation in the "Sunshine State" (Eriksen 1994).

World War II and the Post War Period (1940–1950)

From the end of the Great Depression until after the close of the post-war era, Florida's history was inextricably bound with World War II and its aftermath. It became one of the nation's major training grounds for the various military branches including the Army, Navy, and Air Force. Prior to this time, tourism had been the state's major industry and it was brought to a halt as tourist and civilian facilities, such as hotels and private homes, were placed into wartime service. The influx of thousands of service members and their families increased industrial and agricultural production in Florida, and also introduced these new residents to the warm weather and tropical beauty of Florida.

Railroads once again profited, since service members, military goods, and materials needed to be transported. However, airplanes were now becoming the new form of transportation, and Florida became a major airline destination. The highway system also was being expanded at this time. The State Road Department constructed 1,560 miles of highway during the war era (Miller 1990).

In 1939, the Banana River Naval Air Station was constructed at Cape Canaveral because of the oncoming threat of war, therefore increasing the amount of traffic that came and went from the island. The bridge that was built in 1922 was in a state of disrepair and could no longer handle the growing amount of traffic, leading the State Road Department in 1940 to authorize dredging the causeway and installing a concrete bridge and steel span in the center. The dredging went along as scheduled, however, before the center span could be built, World War II broke out and steel was diverted to military purposes (*The Star-Advocate* 1980:42).

In October 1940, the county and city governments began to receive large sums of Federal money for road and airport improvements. Melbourne received more than $212,000 to expand its airport's administrative building and runways. In order to bolster defenses against German U-boat attacks in eastern Florida, the Navy selected Melbourne as the only likely site for a second air base in Brevard County; and, in mid-1942 the Melbourne Eau Gallie Airport was converted into the Melbourne Naval Air Station. After $5 million expenditure for improvements, the Navy activated the installation on October 20, 1942. This installation was used as a training center where student pilots received on-the-ground experience in "Link trainers," and then practiced landings at runways west of Malabar and Valkaria (Eriksen 1994:193–199).

At the conclusion of World War II, Florida's economy was almost fully recovered. Tourism quickly rebounded and became the major source of the state's economy. Additionally, former military personnel found the local climate amiable and remained in Florida permanently after the war. These new residents greatly increased the population in the 1940s.

In 1947, Melbourne was chosen as the site of a new state hospital. This hospital, officially known as the Florida State Board of Health Treatment Center, was a 500-bed facility that occupied part of the now deactivated Melbourne Naval Air Station. However, the Navy wanted to continue some of its operations in 1946 that introduced new technology during the war. Therefore, an electronics training center was opened at the formal installation, which had been re-opened to the public as the Melbourne Airport, although the Federal government still retained ownership to acreage within the airport property boundaries (Eriksen 1994:201–203).

Following the conclusion of World War II, interest in the construction of a new bridge over the Indian River was revitalized. On February 19, 1948, the State Road Department awarded construction of the center concrete and steel portion of the new bridge to the Cleary Brothers Company of West Palm Beach; Urial Blount was the State Road Department engineer who worked on the bridge. The 1948 bridge was named after Roy F. Roberts, a former state representative (*The Star-Advocate* February 1949:1). However, the bridge was often referred to as the Indian River Bridge. The old wooden bridge was partially retained as a fishing pier

and renamed the Veterans Memorial Pier, but eventually was condemned and has since been replaced with a concrete and wood structure.

Modern Period (1951 - Present)

The Town of Titusville experienced steady growth and population increases during the 1950s and early 1960s, when the towns of Whispering Hills and Indian River City were consolidated with Titusville. During the 1960s, the Kennedy Space Center and the space program greatly contributed to the local economy, as motels, multi-rise apartment buildings, a public hospital, shopping centers, new golf courses, churches, and subdivisions were constructed to accommodate the influx of new residents and employees in the area. Major companies such as TWA, McDonnell-Douglas, Boeing, North America, Grumman, and Bendix established manufacturing facilities and offices in the area. However, the end of the Apollo program in the 1970s and the fluctuations in the Space Shuttle Program of the 1980s and 1990s increased financial difficulties for the community during these decades (City of Titusville n.d.).

FLORIDA MASTER SITE FILE SEARCH AND LITERATURE REVIEW

A search of the FMSF served as a guide to the field investigations by identifying the possible locations of any archaeological sites and historic resources within the project area and providing expectations regarding the potential historic significance of any such sites. This information is based on the most current FMSF data, which is not a comprehensive inventory of cultural resources and their significance and may not reflect existing conditions. It is important to remember that the FMSF serves as an archive and repository of information about Florida's recorded cultural resources. It represents an inventory of resources for which available information exists and describes their condition at a particular point of time. Because the inventory of resources is not all-inclusive on a statewide basis, gaps in data may exist. It can be used as guide but should not be used to determine the FDHR/SHPO official position about the significance of a resource. Additionally, an extensive search of pertinent literature and records of the surrounding region was conducted to determine the locations of previously recorded National Register–listed, eligible, and potentially eligible resources within and adjacent to the project area, as well as, any archaeological and historical assessments of other tracts of land within one mile of the project area.

Previously Conducted Cultural Resource Surveys

While two cultural resources surveys have been previously performed within one mile of the project area, the majority of the project area has never been surveyed for cultural resources. No cultural resource surveys have been previously conducted within the boundaries of the CCEC Site.

In 2001, Southeastern Archaeological Research, Inc. conducted the *Phase I Cultural Resource Survey of Florida Gas Transmission Company Phase VI Expansion Loop C, Loop D, Loop E, Leesburg Lateral Loop, Cape Kennedy Lateral Loop, and Stanton Lateral* (FMSF Survey No. 6850). Portions of an access road included in the 2001 survey, fall within the Offsite Construction Laydown and Parking Area. These previously surveyed areas are predominantly confined to areas within the existing transmission line corridor and along Broadway Boulevard. No cultural resources were identified within the project area during the 2001 survey.

In 2000, Panamerican Consultants, Inc. conducted the *Cultural Resource Assessment Survey of the Proposed Buccaneer Gas Pipeline* (FMSF Survey No. 5840). The survey was conducted approximately 2,400 ft. west of the Offsite Construction Laydown and Parking Area and did not identify any cultural material in the vicinity of the current project area.

Previously Recorded Cultural Resources

Preliminary background research using the FSMF revealed three previously recorded archaeological sites within one mile of the project area. No previously recorded archaeological sites are located within the project area. Site 8BR207 is approximately 225 ft. south of the CCEC Site while sites 8BR1716 and 8BR1719 are located over 2000 ft. to the

west of the Offsite Construction Laydown and Parking Area. These three archaeological sites are listed in Table 1, and their locations are shown in Figure 5.

Table 1. Previously Recorded Archaeological Sites within One Mile of the Project Area

FMSF #	Site Name	Description	National Register Evaluation[1]
8BR207	Jones Point	Malabar I low-density lithic and ceramic scatter	Not Evaluated
8BR1716	Carol and Nicole	Pre-Columbian low-density lithic scatter	Ineligible
8BR1719	Carol and Nicole Site B	Pre-Columbian low-density artifact scatter	Ineligible

1 As recorded in the FMSF; may require re-evaluation

None of these three previously recorded archaeological resources were listed in the FMSF as having potential or confirmed human remains, and none of these previously recorded archaeological resources have been determined to be National Register–listed, eligible, or potentially eligible by FDHR/SHPO.

No previously recorded historic structures, historic districts, historic cemeteries, historic bridges, or historic linear resources were identified within one mile of the project area.

USGS Quadrangle Map and Historic Aerial Review

In addition to the FMSF, the Sharpes USGS quadrangle map and historic aerial photographs were also reviewed to help identify potential historic resources. Aerial photographs of the survey area dating from 1943 (State University System of Florida [SUSF] 2004) were compared to current aerials in order to form an impression of the properties and development from the historic period in comparison to the present day. These aerial photographs revealed that development was sparse in the area as of 1951; a few scattered buildings sited along US 1 are visible on the historic aerials. Aerial photographs illustrating the vicinity of the project area in 1943, 1951, and 1970 are included in Figures 6-8 (SUSF).

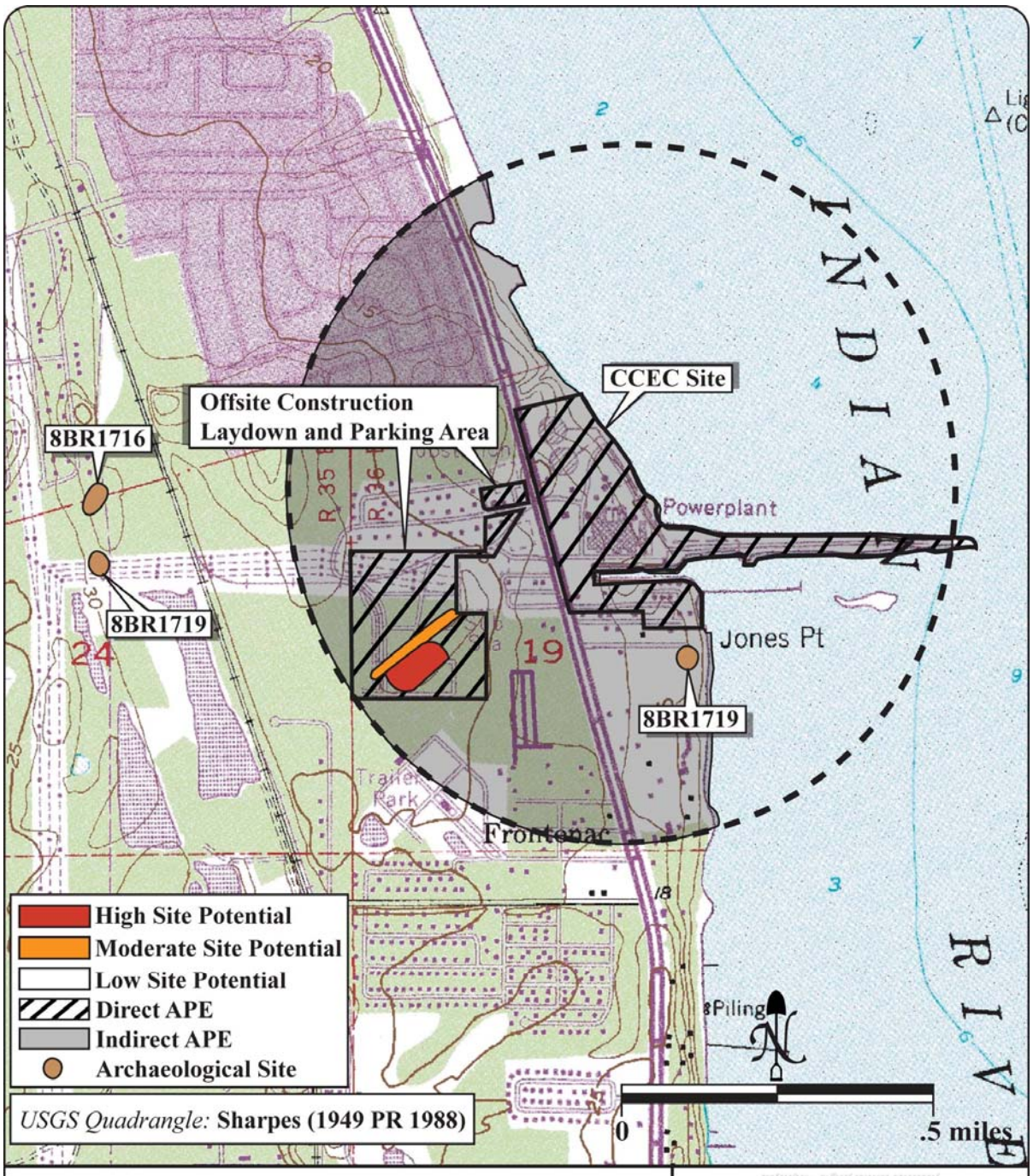


Figure 5: Archaeological Probability Zones and Previously Recorded Archaeological Sites within One Mile of the Project Area

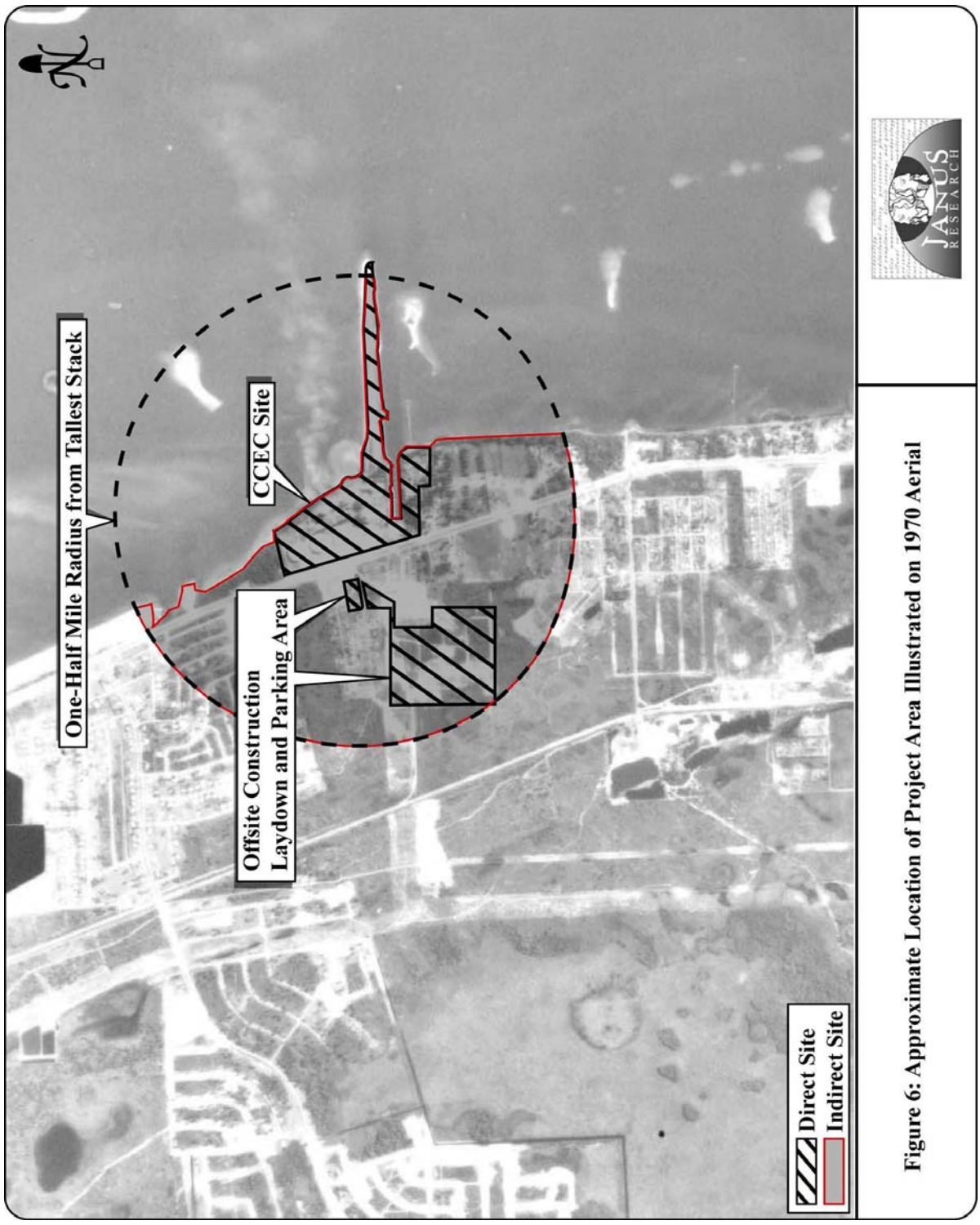


Figure 6: Approximate Location of Project Area Illustrated on 1970 Aerial

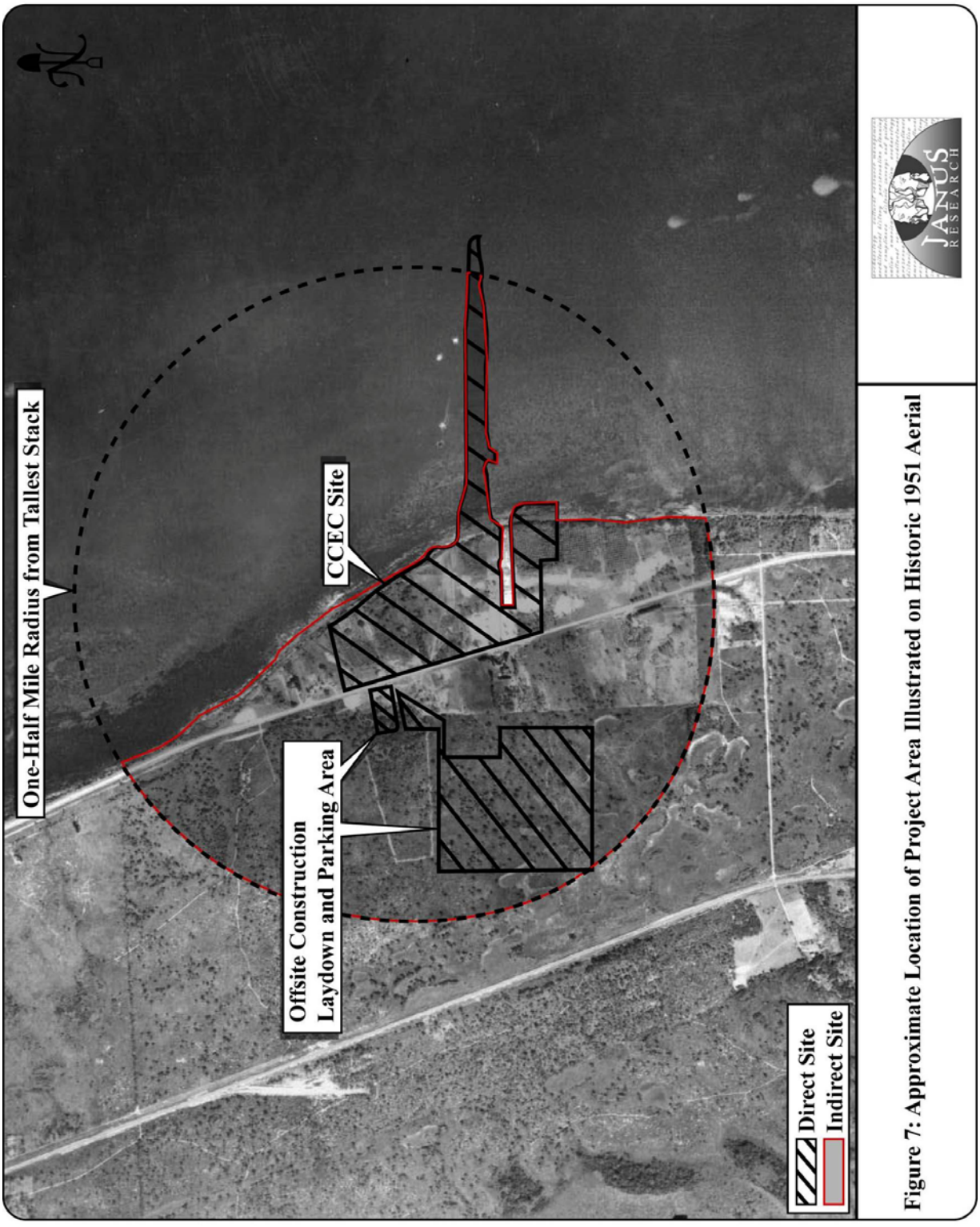


Figure 7: Approximate Location of Project Area Illustrated on Historic 1951 Aerial

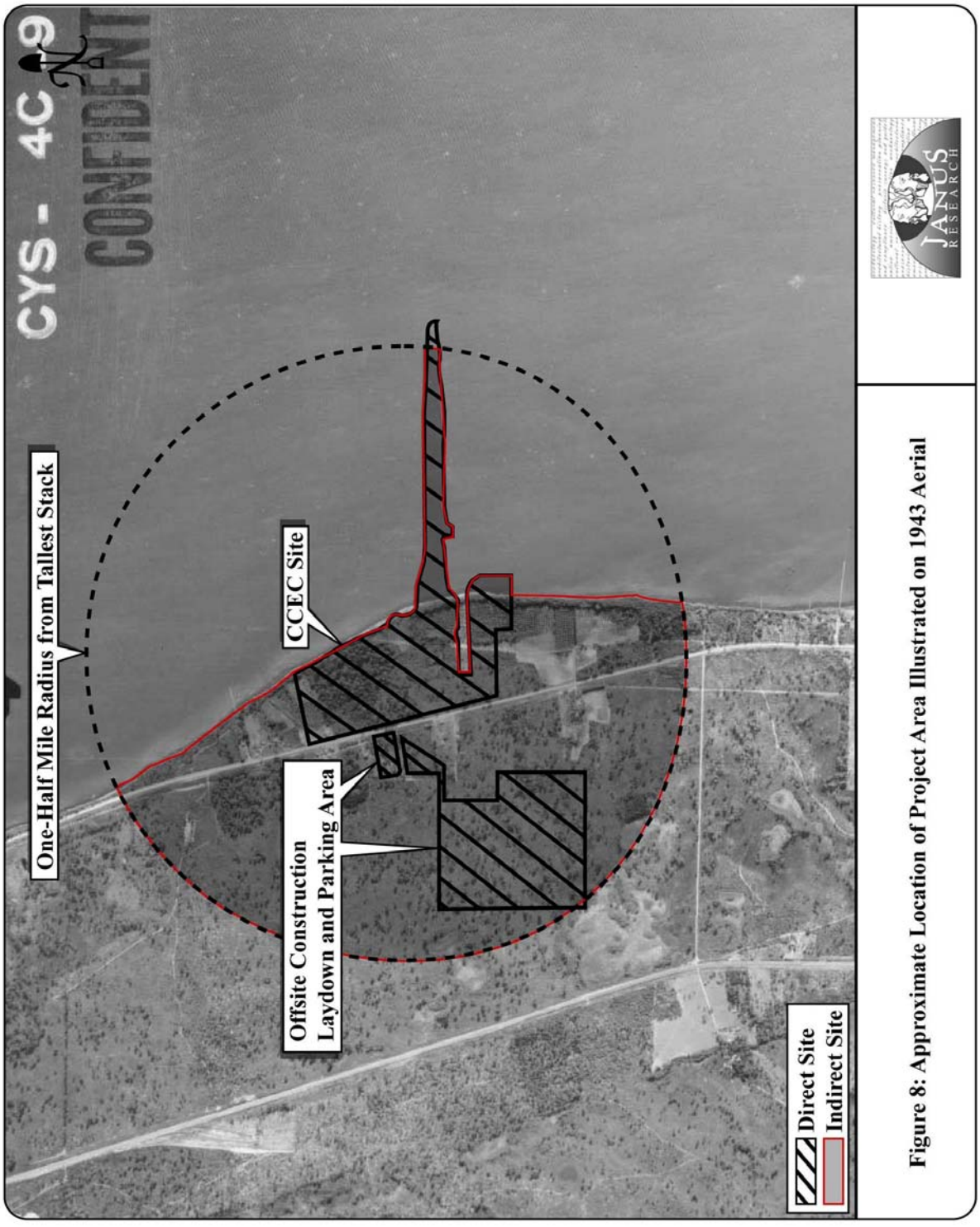


Figure 8: Approximate Location of Project Area Illustrated on 1943 Aerial

AGENCY COORDINATION

CLG Coordination and Local Informants

Brevard County is not included on the November 2008 list of CLG posted on the Florida Division of Historical Resources website (FDHR 2008). Additionally, no municipalities within the vicinity of the project area (including Frontenac, Delespine, Titusville, and Cocoa) are included on the FDHR CLG list. Brevard County does not employ a county archaeologist.

Mr. Doug Foust, Maintenance Coach of the Cape Canaveral Plant, provided information regarding the non-historic nature of the Cape Canaveral power plant and stated that to his knowledge, the plant did not employ new or innovative technology at the time of its construction. Mr. Foust also provided information about the location of areas of man-made land and land modification, general locations of buried utilities, and provided access to the different sections of the project area.

PROJECT RESEARCH DESIGN AND SITE LOCATION MODEL

The objective of a research design is to examine the land-use history of the project area and to provide a project-specific guide for the location, identification, and evaluation of cultural resources. Site potential zones were designated based on their potential for containing archaeological sites (Figure 4). These site potential zones were based on the background research, previous research conducted within the East and Central cultural region, and more specifically, Brevard County, in conjunction with pertinent environmental variables. Variables used to determine site potential zones include distance to fresh water sources (e.g., lakes, creeks, and wetlands), relative elevation, soil drainage characteristics, and the presence of hardwood vegetation.

Pre-Development Environment and Land Use History

A review of GLO historic plat maps and surveyors' field notes was conducted to look at the past environmental conditions of the project area. The CCEC Site is situated on the western bank of the Indian River Lagoon and is described as second rate pineland with palm and scrub vegetation (FDEP 1859a, 1859b, 1927). The Offsite Construction Laydown and Parking Area is situated between approximately 1000 ft. west of the Indian River Lagoon and is described as second rate pineland with palm and scrub vegetation (FDEP 1859a, 1859b, 1927).

The historic plat maps were also reviewed for evidence of homesteads or other early settlement. During the nineteenth century (post-1821), historic settlement tended to follow the isolated homestead or farmstead pattern. Individual families or groups of related families often built homesteads on the better-drained, hardwood hammocks. There were usually several miles between these settlements to allow room for farm fields. A review of the historic plat maps shows no indication of military forts, encampments, battlefields, homesteads, farmsteads, roads, or historical Native American villages located within the project area. However, the Delespine Grant is illustrated on the historic plat maps and is located approximately 600 ft. to the north of the CCEC Site and 900 ft. to the north of the Offsite Construction Laydown and Parking Area. The grant was given to the French physician Joseph Delespine in 1817 and was one of the largest land grants designated by the Spanish (Zimmerman n.d.).

A review of historic aerials from 1943, 1951, and 1970 (SUSF 2004) was conducted to better analyze historic land use and assist with the evaluation of possible historic buildings. The aerials were also reviewed for environmental features suggestive of archaeological site potential such as hammock vegetation.

As shown by the 1943 historic aerial, in the early 1940s the northern portion of the CCEC Site consisted of agricultural fields or grove. The middle section of the CCEC Site consisted of uncleared woods and the southeastern portion consisted of additional groves or agriculture fields. Structures likely associated with this agricultural development are located within the northern and southeastern sections of the CCEC Site at this time. In the 1940s, U.S. 1 is already visible, but only as a two lane road. The portion of the CCEC Site extending into the

Indian River is not yet present in the 1943 aerial, and the channelized portion adjacent to the southeast of the CCEC Site has not yet been channelized. The 1943 historic aerial depicts the Offsite Construction Laydown and Parking Area as an area of unimproved pine flatwoods. A railroad corridor (currently an FEC Railroad Line) is also visible over 800 ft. west of the Offsite Construction Laydown and Parking Area.

As evidenced by the 1951 aerial, by the early 1950s, agricultural development within the CCEC Site is consistent with the early 1940s aerial. However, a large portion of the middle section of the CCEC Site has been cleared of wooded areas. The jetty and channelized area are still not visible on the 1951 historic aerial. By this time, the surrounding area is starting to show minimal signs of development including additional roads/trails, structures, and cleared areas. However, most of the development seems to be occurring between U.S. 1 and the bank of the Indian River. The 1951 historic aerial also shows development to the south and northeast of the northernmost portion of the Offsite Construction Laydown and Parking Area. However, the remainder of the Offsite Construction Laydown and Parking Area is still predominantly unimproved pine flatwoods.

As evidenced by the 1970 aerial, the CCEC Site was industrially and residentially developed during the late 1960s. The power plant and associated structures are visible within the northern portion of the CCEC Site, as is the structural development in the southern portion. Additionally, by 1970, U.S. 1 has expanded with separate northbound and southbound lanes.

By 1970, the CCEC Site has become largely developed and portions have become disturbed through the construction of the jetty into the Indian River and the channelized segment of land bordering the southeastern portion of the CCEC Site. The developed and disturbed characteristics suggested by the historic aerials are supported by the 1974 Brevard County soil survey descriptions of the soil types located within the CCEC Site (Table 1).

Table 3. Description of Soil Types Located within the CCEC Site

Drainage Characteristic	Soil Type	Environmental Association
Moderately well drained	Canaveral-Urban Land Complex	Developed Areas; Sand/Shell Dredged from the Indian River
	Pomello Sand	Broad Low Ridges
	Pomello-Urban Land Complex	Developed Areas
Poorly drained	Myakka-Urban Land Complex	Developed Areas
Very poorly drained	Basinger Sand, Depressional	Depressions in the Flatwoods
N/A	Urban Land	Developed Areas

Source: USDA 1974

The 1970 aerial also illustrates the presence of the transmission line corridor within the north-central portion of the Offsite Construction Laydown and Parking Area and the presence of the two adjacent substations. Several of the soils within the Offsite Construction Laydown and Parking Area are indicative of development and land modification (Table 5)

Table 4. Description of Soil Types Located within the Project Area

Drainage Characteristic	Soil Type	Environmental Association
Excessively well drained	Paola Fine Sand, 0 to 5 Percent Slopes	Tops and Sides of Ridges
	Paola Fine Sand, 0 to 8 Percent Slopes	Tops and Sides of Ridges
Moderately well drained	Canaveral-Urban Land Complex	Developed Areas; Sand/Shell Dredged from the Indian River
	Pomello Sand	Broad Low Ridges
	Pomello-Urban Land Complex	Developed Areas
	Quartzipsamments, Smoothed	Shaped and Reworked Land near Urban Centers
Poorly drained	Myakka-Urban Land Complex	Developed Areas
	Immokalee Sand	Broad Areas and Low Ridges in the Flatwoods

Source: USDA 1974

Today the majority of the CCEC Site is industrially developed and man-made in nature providing support for the low probability of finding intact archaeological sites within the CCEC Site boundaries. Additionally, this survey noted the presence of numerous above and below ground utilities within this portion of the project area. Currently the Offsite Construction Laydown and Parking Area contains an existing transmission line corridor, a small ridge, grassy open areas with scattered tree cover, and areas of land modification. The current conditions of the CCEC Site (the general locations of utilities, ponds, bermed land, and made land) are illustrated on an aerial field maps in Appendix D.

Archaeological Site Potential Zones

Fresh water was an important resource for precontact populations. This variable would have been of greater importance during the Paleoindian and Early Archaic stages (12,000–5000 BC), when the perched water system was more restricted. Access to fresh water during these early periods would have been from sinkholes and aquifer-fed rivers.

The project area is located within the vicinity of the Indian River Lagoon and several unnamed wetland areas. With the abundance of fresh water sources in the vicinity of the project area, elevation is an important factor in determining probable archaeological site locations.

Sites in Brevard County can often be found on ridges and in areas of higher elevation near fresh water sources. The USGS Quadrangle map was reviewed to target areas of higher elevation and particular focus was placed on slopes adjacent to fresh water sources. These areas were deemed to have high archaeological site potential while areas of low relative elevation adjacent to wetlands were determined to have moderate archaeological site potential. The elevation of the CCEC Site ranges between 1.5-8 m (5-25 ft.) above mean sea

level while the elevation of the Offsite Construction Laydown and Parking Area ranges between 6-9 m (20-30 ft.) above mean sea level.

Drainage characteristics of soil have been successfully used in the formulation of site location and predictive models. Moderately well drained and excessively well drained soil types, particularly those found in areas of higher elevation, were determined to have high archaeological site potential. Soils with somewhat poorly drained or poorer drainage characteristics not indicative of hammock vegetation were designated as having moderate archaeological site potential. As mentioned previously, a large number of the soils within the project area are indicative of development and disturbance. In fact, the only two soils within the CCEC Site that are not urban land or do not contain urban land complex are located in the northernmost portion of the project area that was disturbed during the creation of the bermed area surrounding the container units.

The use of hammock vegetation during the precontact and historic periods is well documented. Hammocks are not usually prone to flooding and retard the development and spread of fires (Austin 1992). The thick foliage of hammocks provides shade and moderates temperatures year-round. The thick canopies of hammocks also provide good shelter during periods of heavy weather. Mature hammocks offer enough open space for habitation and activity areas. Finally, many fruits, nuts and tubers are available in hammocks that are important as human food sources as well as for their ability to attract game animals. For these reasons, soil types indicative of hardwood or hammock vegetation are designated as high archaeological site potential zones regardless of drainage characteristics. However, none of the soils within the project area typically support hardwood hammock vegetation, and no hardwood hammock vegetation was visible on the historic aerials.

In Florida, historic period sites frequently co-occur with precontact archaeological sites. This is often the result of environmental conditions found desirable by both groups: better-drained upland knolls near transportation routes (i.e., historic trails and major rivers). Use of the land around the project area during the earliest historic periods (First Spanish, English, and Second Spanish) was probably limited; occupations from these periods would have been of such short duration that evidence of parties crossing the project vicinity is almost impossible to detect archaeologically. Furthermore, no such groups are known or suspected of having settled or camped within the project area.

While the CCEC Site is situated adjacent to a major waterway, the low elevation of the area may have increased the probability of seasonal flooding. Additionally, the GLO surveyors' field notes for the CCEC Site do not mention any hardwood or hammock vegetation. These factors, coupled with the level of industrial development and land modification within the CCEC Site suggest a low potential for finding intact archaeological sites.

The majority of the Offsite Construction Laydown and Parking Area is over 1000 ft. from the Indian River, but is still in the vicinity of unnamed wetlands. The relatively low elevation of the area may still have increased the potential for flooding and no hardwood or hammock vegetation is mentioned in the GLO surveyors' field notes. The level of land modification, as evidenced by the disturbed nature of the soils in the northeastern and central portions of the

Offsite Construction Laydown and Parking Area suggest a low potential for finding intact archaeological sites. The western border of the Offsite Construction Laydown and Parking Area, as well as the south-central border, contain poorly drained soils and are also indicative of a low archaeological site potential. The remaining portions of the Offsite Construction Laydown and Parking Area contain a small ridge and favorable drainage characteristics that suggest a moderate to high potential for finding intact archaeological sites.

METHODS

Field procedures consisted of archaeological surface inspections, subsurface testing, a historic resource survey of the APE for direct effects, and a historic resource reconnaissance survey for the APE for indirect effects. The methods were employed to locate and evaluate archaeological sites and historic resources in terms of their National Register–eligibility.

Archaeological Survey Methods

Archaeological field methods included the pedestrian survey of the project area and visual inspection of exposed ground to identify evidence of archaeological sites. A careful surface inspection was done in areas of minimal vegetation and/or upturned soil and in areas adjacent to past dredging. Gopher tortoise burrows were encountered within the project area, and each apron was inspected for cultural material.

Shovel tests were placed systematically at 25-m (82-ft) intervals within high site potential zones and at 50-m (164-ft) intervals within moderate site potential zones. Shovel tests were placed judgmentally in low site potential zones. Testing was performed at the specified interval unless obvious ground disturbance, buried utilities, or standing water was encountered. Field crews were instructed to place additional shovel tests in areas they deemed likely for sites, regardless of the potential zone designation or testing interval.

During the current survey, 27 shovel tests were excavated. Shovel tests were circular and roughly 50 cm (20 in) in diameter. They were dug to a minimum depth of 1 m (39 in), unless excavation was inhibited by pit slumping due to the influx of water or by subsurface obstructions such as concreted clay. All excavated soil was screened through ¼-in hardware cloth suspended from portable wooden frames.

Standard archaeological methods for recording field data were followed throughout the project. The identification number, location, stratigraphic profile, and soil descriptions were recorded for every shovel test performed. Field notes also included artifact counts, provenience information, and description of any cultural feature encountered during testing. The location of all shovel tests were recorded on 1”=61 meter current aerial photographs and are included in Appendix D. Labels indicating the shovel test number are placed next to the shovel test location. Field conditions have also been noted on these aerial maps.

No subsurface testing was conducted within the CCEC Site based on the low archaeological site potential resulting from the disturbed and developed nature of the area. The site contained bermed man-made ponds, bermed areas adjacent to road ways and containers, areas containing roadway or concrete/asphalt paving, and large segments of man-made and modified land. Above ground and buried utilities were located throughout the CCEC Site.

Sunshine State One Call-Center Coordination

As needed and as required by the Underground Facility Damage Prevention and Safety Act (Chapter 5566, F.S. [1993]), prior to the beginning of the archaeological survey, tickets were entered with the Sunshine State One Call-Center in order to mark the locations of

underground utilities in areas of development and roadways. A total of five underground utilities were located in the vicinity of Clear View Drive, Codner Lane, Broadway Avenue, and U.S. Highway 1. These included:

- AT&T (telephone)
- City of Cocoa (water)
- Florida City Gas (gas pipeline)
- Florida Gas Transmission – Melbourne (gas pipeline)
- Florida Power and Light – Brevard (electric)

Archaeological testing is not conducted within utility corridors for several reasons: the area has been disturbed by the excavation and burial of the utility, concern for the safety of archaeological field teams, and potential for substantial fines if a utility is damaged.

Historic Resources Survey Methods

An architectural historian and technician conducted a pedestrian survey of the CCEC Site and Offsite Construction Laydown and Parking Area in order to ensure that National Register of Historic Places (National Register) historic resources built during or before 1961 within the APE for direct effects were identified and properly mapped. Additionally, a historic resources reconnaissance survey was conducted for an area of one-half mile radius from the CCEC Site in order to identify and document historic resources considered eligible for inclusion in the National Register or currently listed in the National Register.

Prior to the reconnaissance survey fieldwork, background research was performed which included a review of Florida Master Site File (FMSF) and GIS data, as well as a review of the USGS quadrangle map and historic aerial photographs. Information was also requested regarding noise, light, emission or other visual complaints from residents of the area surrounding the current CCEC site. No such records were available.

No previously recorded historic resources were revealed during the background research. In addition, historic aerials of the survey area dating from 1951 were compared to the current aerials in order to form an impression of the properties and development from the historic period in comparison to the present day. These aerials reveal that development was sparse in the area as of 1951; a few scattered buildings sited along U.S. 1 are visible on the historic aerials.

Resources within the APE for direct effects with features indicative of 1961 or earlier construction materials, building methods, or architectural styles, were noted on aerial photographs and a USGS Quadrangle map. For each identified resource within the APE for direct effects, FMSF forms were filled out with field data, including notes from site observations (Appendix B). The estimated date of construction, distinctive features, and architectural style were noted. The information contained on any FMSF Historic Structure form completed for this project was recorded in a database at Janus Research. Photographs

were taken with a high resolution digital camera, and a log was kept to record the resource's physical location and compass direction of each photograph.

Within the direct APE, each resource's individual significance was then evaluated for its potential eligibility for inclusion in the National Register. Historic physical integrity was determined from site observations, field data, and photographic documentation (including historical images and aerials).As many of the structures in the FPL Cape Canaveral Plant complex date to the mid- to late-1960s and are not yet fifty years old, research was also conducted to determine whether the complex meets the National Register Criteria Consideration G for properties that have achieved significance within the past fifty years.

RESULTS

Archaeological Resources

No archaeological sites were newly identified within project APE. A total of 27 shovel tests were excavated within the Offsite Construction Laydown and Parking Area. These subsurface tests resulted in varied stratigraphic sequences several of which were consistent with land modification and disturbance. No cultural material was identified in any of the tests. Numerous gopher tortoise burrows were located within the Offsite Construction Laydown and Parking Area, and while many looked abandoned, the apron of each burrow was inspected for cultural material. No cultural material was identified within any of the burrow aprons. The current conditions of the Offsite Construction Laydown and Parking Area are illustrated on an aerial field map, as well as, the general locations of utilities in Appendix D.

The pedestrian survey and surface inspection of the CCEC Site confirmed the industrial development and man-made nature of the majority of the CCEC Site providing support for the low probability of finding intact archaeological sites within the CCEC Site boundaries. Additionally, this survey noted the presence of numerous above and below ground utilities in this portion of the project area. Due to these factors, no subsurface testing was conducted in the CCEC Site. The current conditions of the CCEC Site are illustrated on an aerial field map, as well as, the general locations of utilities, ponds, bermed land, and made land (Appendix D).

Historic Resources Identified within the APE for Direct Effects

The historic resources survey for direct effects resulted in the identification no National Register–listed or eligible historic resources within CCEC Site or Offsite Construction Laydown and Parking Area. One building (8BR2317) on the southwest corner of the FPL Cape Canaveral Plant complex was identified by Mr. Foust as potentially related to a previous, historic gas station which was located at the site (Figure 8). A review of Brevard County property appraiser records and historic aerial photographs could not confirm a historic date of construction; however, it appears that the building could date to 1960 or earlier. The building is a simple, industrial structure similar to others found throughout Florida and is not eligible for listing in the National Register. It is rectangular in form with a concrete block structural system and flat roof. All evidence of the historic gas station has been removed and the building's historic context has been significantly altered as it is now a part of the CCEC Site. The FMSF form for the building is included in Appendix B and its location is depicted in Figure 9.



Figure 9: Photograph of 6000 North US Highway 1 (8BR2317), facing NW

As the majority of the buildings within the FPL Cape Canaveral Plant complex were constructed within the past fifty years, research was also conducted, and the non-historic buildings evaluated, to determine whether the complex meets the National Register Criteria Consideration G for properties that have achieved significance within the past fifty years. The buildings and structures constructed within the past fifty years are of common architectural forms and styles, and limited research revealed no significant associations. The Cape Canaveral Plant did not represent a new or innovative technology at the time of its construction (Doug Foust, personal communication 2008). The plant is associated with the area's patterns of community planning and development and the development which occurred in support of the Kennedy Space Center. However, the minimal association that the plant has with the area's community planning and development does not meet the National Register's standard of exceptional importance for properties constructed within the past fifty years.

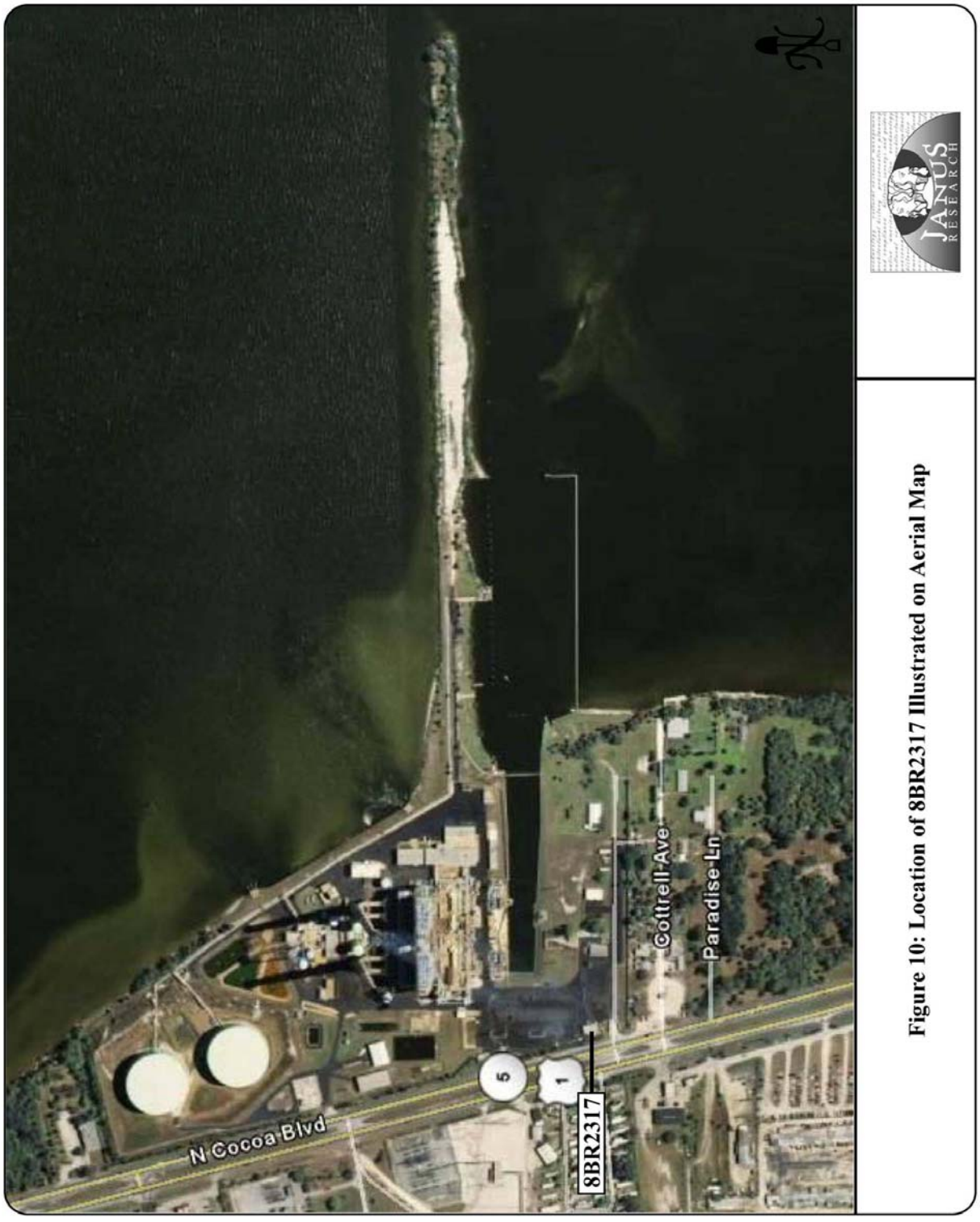


Figure 10: Location of 8BR2317 Illustrated on Aerial Map

Historic Resources Identified within the APE for Visual Effects

The historic resources reconnaissance survey for visual effects resulted in the identification of no historic resources within the one-half mile radius of the CCEC Site that are considered eligible for inclusion in the National Register, determined eligible for the National Register, or currently listed in the National Register.

A significant portion of the one-half mile area that radiates from the CCEC Site to the east was the Intracoastal Waterway and the remaining survey area is characterized by commercial and residential buildings. Representative photographs are included in Appendix C. A non-historic cemetery is located in the southwestern portion of the reconnaissance survey area.

Potential Indirect Effects

As no potentially eligible, eligible, or National Register-listed buildings were identified within the one-half mile radius of the CCEC Site that could potentially be indirectly affected, no additional analysis of potential secondary and cumulative impacts (i.e. air, noise, lights, and emissions) was conducted.

Although there are no National Register eligible of listed historic resources within the indirect APE, the proposed plant will have a smaller footprint than the current one. This, along with the reduction in height of the stacks from 400 feet to 150 feet, will result in a positive visual change for the surrounding area. Before and after renderings are included in Figures 11-13.



Figure 11: Existing Conditions



Figure 12: Next Generation Clean Energy Facility

Cape Canaveral Point of View Renderings

Cocoa, Florida

Northern View

After



Before



SouthEast View

After



Before



Southern View

After



Before



Conceptual Artist Rendering

Figure 13: Point of View Renderings

FPL

CONCLUSIONS

No newly identified or previously recorded archaeological sites were identified within the CCEC Site or Offsite Construction Laydown and Parking Area.

The historic resources survey for direct effects resulted in the identification of no National Register–listed or eligible historic resources within CCEC Site or Offsite Construction Laydown and Parking Area. One historic structure (8BR2317) was identified within the CCEC Site as potentially related to a previous, historic gas station which was located at the site. All evidence of the historic gas station has been removed and the building's historic context has been significantly altered. A simple, industrial structure similar to others found throughout Florida, 8BR2317 is not considered eligible for listing in the National Register.

The historic resources reconnaissance survey for visual effects resulted in the identification of no historic resources within the one-half mile radius of the CCEC Site that are considered eligible for inclusion in the National Register, determined eligible for the National Register, or currently listed in the National Register. As no potentially eligible, eligible, or National Register-listed buildings were identified within the one-half mile radius of the CCEC Site that could potentially be indirectly affected, no additional analysis of potential secondary and cumulative impacts (i.e. air, noise, lights, and emissions) was conducted.

Unanticipated Finds

A formal Unanticipated Finds or Discover Plan and Contractor Training will be prepared in coordination with FDHR prior to the start of construction. Should construction activities uncover archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains. In the event that human remains are found during construction or maintenance activities, the provisions of Chapter 872.05 of the *Florida Statutes* will apply. Chapter 872.05 states that, when human remains are encountered, all activity that might disturb the remains shall cease and may not resume until authorized by the District Medical Examiner or the State Archaeologist. The District Medical Examiner has jurisdiction if the remains are less than 75 years old or if the remains are involved in a criminal investigation. The State Archaeologist has jurisdiction if the remains are more than 75 years of age.

Curation

Original FMSF forms (Appendix B), representative photographs (Appendix C), field maps (Appendix D), and Survey Log Sheets (Appendix E) will be curated at the Florida Master Site File in Tallahassee, along with a copy of this report. Recovered materials are temporarily stored at Janus Research during the investigation. Field notes and other pertinent project records are temporarily stored at Janus Research and returned to the client, as appropriate.

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APPENDIX A:

SHPO CONCURRENCE LETTER FOR
2008 CCEC SITE SURVEY

FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Ms. Kathleen Hoffman, Ph.D.
Janus Research
1300 N. Westshore Blvd., Suite 100
Tampa, Florida 33607

November 21, 2008

Re: DHR Project File No.: 2008-06618 / Received by DHR: October 20, 2008
Cultural Resource Review for the FPL Cape Canaveral Plant

Dear Dr. Hoffman:

Our office received and reviewed the above referenced survey report in accordance with Chapters 267, 373, and 403 of the *Florida Statutes*, as well as pertinent Brevard County local ordinances, for possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places (NRHP).

In September 2008, Janus Research conducted an archaeological and historical survey of the proposed Cape Canaveral Plant Conversion project area on behalf of Florida Power & Light Company and Golder Associates. Janus Research identified one previously unrecorded historic building within the project area during the investigation.

Janus Research determined that the Former Gas Station (8BR2317) is ineligible for listing on the NRHP based on common construction, extensive alterations, and lack of historical associations.

Janus Research determined that the proposed development will have no effect on cultural resources listed, or eligible for listing, in the NRHP, or otherwise of historical, archaeological, or architectural value. Janus Research recommends no further investigation of the subject parcel.

Based on the information provided, our office concurs with these determinations and finds the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

For any questions concerning our comments, please contact April Westerman, Historic Preservationist, by electronic mail at amwesterman@dos.state.fl.us, or by phone at (850) 245-6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

Frederick P. Gaske

Frederick P. Gaske, Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

❒ Director's Office
(850) 245-6300 • FAX: 245-6436

❒ Archaeological Research
(850) 245-6444 • FAX: 245-6452

☑ Historic Preservation
(850) 245-6333 • FAX: 245-6437

APPENDIX B:

FMSF FORMS

Original ☐
Update ☑



HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE

Consult Guide To Historical Structure Forms for detailed instructions

Site # 8BR2317
Recorder # 1
Recorder Date 9/3/08

Site Name Former Gas Station Building **Other Names**
Project Name Cultural Resource Review for FPL Cape Canaveral Plant
Historic Contexts Modern **National Register Category** Building

LOCATION and IDENTIFICATION

Address 6000 N US Highway 1
Vicinity of East side of US Highway 1 between Cottrell Avenue and Clearview Drive
City Cocoa **County** Brevard
Ownership Private **Subdivision** **Block #** **Lot #**

MAPPING

USGS Map SHARPES **Township** 23S **Range** 36E **Section** 19
Quarter **Qtr Qtr** **Irregular Section** ☐ **UTM Zone** 17
Easting 523001 **Northing** 3149003 **Land Grant**
Latitude **Longitude** **Plat or Other Map** Aerial Photograph

HISTORY

Architect/Builder Unknown **Construction Date** 1955 **Circa** ☑
Alterations ☐ **Date** **Type/Location**
Additions ☐ **Date** **Type/Location**
Moved ☐ **Original Location**
Use Original Service station **Use Present** Storage building

DESCRIPTION

Style Masonry Vernacular **Exterior Plan** Rectangular **Interior Plan** **Stories** 1
Structural System Concrete block **Exterior Fabric** Concrete block
Foundation Slab **Foundation Materials** Concrete **Foundation Infill**
No. of Porches **Locations/Features**
Main Entrance (stylistic details): E/Metal door
Outbldgs. ☐ **Number** **Nature/Location (Describe below)**

Roof Type Flat **Roofing Materials** Built-up roof
Secondary Structures ☐ **Comments** **Location**
Chimneys ☐ **Number** **Orientation** **Location** **Material**
Wood Windows ☐ **Type** **Light #**
Metal Windows ☐ **Type** **Light #**
Exterior Ornament None
Condition Fair **Surroundings** Industrial; Commercial

Narrative (general, interior, landscape, context; 3 lines only)

This simple Masonry Vernacular building was originally part of a gas station and is now a part of the FPL Cape Canaveral Plant complex. It is rectangular in form with a concrete block structural system and flat roof covered in built-up materials.

Archaeological Remains Present ☐ **FMSF Archaeological Site Form Completed (if yes, attach)** ☐

HISTORICAL STRUCTURE FORM

Site # 8BR2317

Consult Guide To Historical Structure Forms for detailed instructions

RECORDER'S EVALUATION OF SITE

Individually Eligible for National Register? Yes ☐ No ☑ Likely, Need Information ☐ Insufficient Information ☐

Potential Contributor to Nat. Reg. District? Yes ☐ No ☑ Likely, Need Information ☐ Insufficient Information ☐

Areas of Significance

Community planning & development

Summary of Significance

This building is of a common, utilitarian design type found throughout Florida, has undergone alterations, and limited research revealed no significant historical associations. Therefore, it is considered ineligible for listing in the National Register, either individually or as part of a historic district.

DHR USE ONLY	OFFICIAL EVALUATIONS	DHR USE ONLY
NR DATE ___/___/____	*KEEPER-NR ELIGIBILITY* ☐ *yes* ☐ *no*	*Date* ___/___/____
	SHPO-NR ELIGIBILITY: ☐ *yes* ☐ *no* ☐ *potentially elig.* ☐ *insufficient info*	*Date* ___/___/____
DELIST DATE ___/___/____	*LOCAL DESIGNATION:*	*Date* ___/___/____
	Local office	
National Register Criteria for Evaluation ☐ *a* ☐ *b* ☐ *c* ☐ *d* (See *National Register Bulletin 15*, p. 2)		

DOCUMENTATION

Research Methods Florida Site File search; Florida Site File for past architectural surveys; Tax records; Occupant or owner interviewed; Pedestrian

Bibliographic References

Location of Negatives Janus Research **Negative Numbers** Roll 2865, #37, Facing NW

RECORDER INFORMATION

Recorder Name Janus Research

Recorder Affiliation JANUS RESEARCH, 1300 N. Westshore Blvd., Suite 100, Florida 33607 Telephone 813-636-8200

REQUIRED:

1. **USGS 7.5' MAP WITH STRUCTURES PINPOINTED IN RED**
2. **LARGE SCALE STREET OR PLAT MAP**
3. **PHOTO OF MAIN FACADE, PREFERABLY B&W, AT LEAST 3x5**

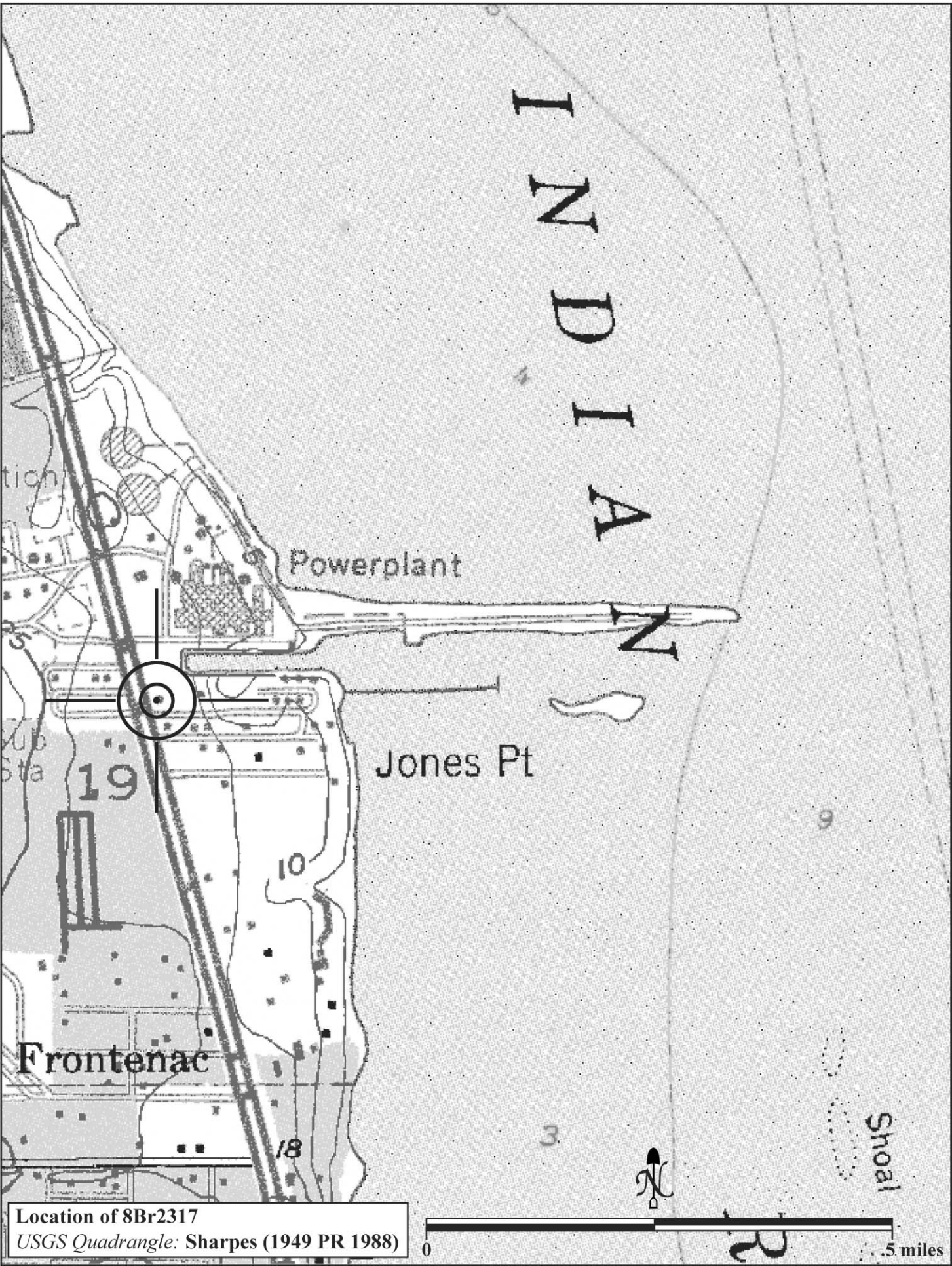
PHOTOGRAPH



SKETCH MAP



USGS QUADRANGLE MAP



Location of 8Br2317
USGS Quadrangle: **Sharpes (1949 PR 1988)**

APPENDIX C:

REPRESENTATIVE PHOTOGRAPHS OF THE PROJECT AREA

REPRESENTATIVE PHOTOGRAPHS OF THE CCEC SITE



Industrial Development, Bermed Percolation Pond, Underground Drains, and Buried Utilities within CCEC Site



Disturbed Paved Area with Buried Utilities within CCEC Site



Drainage Ditch and Developed Area within CCEC Site



Developed and Paved Area with Unmarked Buried Utilities within CCEC Site



Unmarked Buried Utilities within CCEC Site



Modified Land with Structure on Raised Ground within CCEC Site



Modified Land with Sloping Berm adjacent to Channelized Area within CCEC Site



River Sediment/Rock on Surface adjacent to Channelized Area within CCEC Site

REPRESENTATIVE PHOTOGRAPHS OF THE OFFSITE CONSTRUCTION LAYDOWN AND PARKING AREA



Existing Transmission Line Corridor within Northern Portion of the Offsite Construction Laydown and Parking Area, facing W



West-Central Portion of the Offsite Construction Laydown and Parking Area, facing W



Area of High Probability within Offsite Construction Laydown and Parking Area on Small Ridge from Shovel Test 16, facing SW



Grassy Area of Offsite Construction Laydown and Parking Area of from Shovel Test 20, facing S



Central and Eastern Portion of Offsite Construction Laydown and Parking Area from Shovel Test 20, facing E



Northwestern Portion of Offsite Construction Laydown and Parking Area from Shovel Test 23, facing S



Drainage Ditch within Offsite Construction Laydown and Parking Area, facing NW



Northeastern Portion of Offsite Construction Laydown and Parking Area from ST 24, facing N



Spoil Pile within Triangular Portion of Offsite Construction Laydown and Parking Area South of Clear View Drive, facing SW



Small Triangular Portion of Offsite Construction Laydown and Parking Area South of Clear View Drive illustrating Buried Utility Markings, facing NW



Small Rectangular Portion of Offsite Construction Laydown and Parking Area North of Clear View Drive, facing NE



Portion of Offsite Construction Laydown and Parking Area North of Clear View Drive from East of Codner Lane Illustrating Utilities, facing S

REPRESENTATIVE PHOTOGRAPHS OF THE HISTORIC RESOURCE RECONNAISSANCE SURVEY ONE-HALF MILE RADIUS FROM CCEC SITE



Streetscape of Clear View Drive from Alice Lane, facing E



Streetscape of Clear View Drive from 521 Clear View Drive, facing E



Farmers Market on West Side of U.S. Highway 1, facing W



Farmers Market on West Side of U.S. Highway 1, facing SE



Strip Mall on West Side of U.S. Highway 1, facing NW

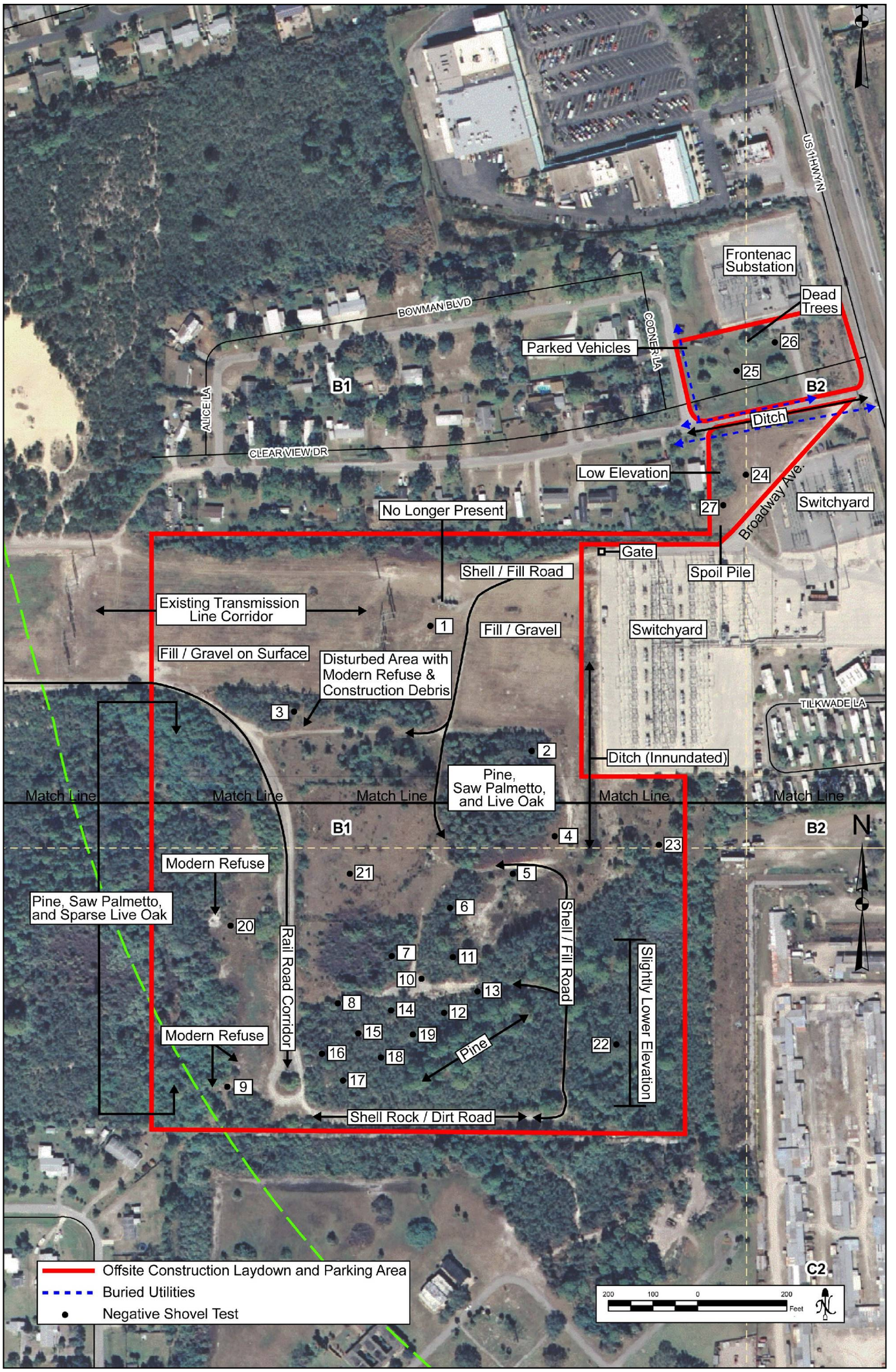


Strip Mall on West Side of U.S. Highway 1, facing SW

APPENDIX D:

SHOVEL TESTS AND CURRENT CONDITIONS ILLUSTRATED ON FIELD AERIAL MAPS


Man-Made Ponds
Power Plant and Industrial Development
Gate 1
Made Land
Man-Made Ponds
Unmarked Sprinkler System
Gate Entrance
Paved Parking Lot
Pavement/Boat Ramp
Paved Area
Site of Old Gas Station
Paved Parking Lot
Paved Area
CCEC Site / Direct APE
Utilities
Bermed Land
River Rock/Sediment from Dredged Channel
Feet
0
200
400
600
800
1,000
N


US 1 HWY N
Frontenac Substation
Dead Trees
BOWMAN BLVD
CODNER LA
Parked Vehicles
26
25
B1
B2
ALICE LA
Ditch
CLEAR VIEW DR
Low Elevation
24
Broadway Ave.
Switchyard
No Longer Present
27
Gate
Spoil Pile
Shell / Fill Road
Existing Transmission Line Corridor
1
Fill / Gravel
Switchyard
Fill / Gravel on Surface
Disturbed Area with Modern Refuse & Construction Debris
TILKWADE LA
3
2
Ditch (Innundated)
Pine, Saw Palmetto, and Live Oak
Match Line
Match Line
Match Line
Match Line
Match Line
B1
B2
N
4
23
Modern Refuse
21
5
Pine, Saw Palmetto, and Sparse Live Oak
6
20
Rail Road Corridor
Shell / Fill Road
7
11
10
13
Slightly Lower Elevation
8
14
12
15
19
Modern Refuse
Pine
22
16
18
9
17
Shell Rock / Dirt Road
Offsite Construction Laydown and Parking Area
Buried Utilities
Negative Shovel Test
C2
200
100
0
200
Feet

APPENDIX E:

SURVEY LOG SHEET

Ent D (FMSF only)__/__/__

Survey Log Sheet

Florida Master Site File
Version 2.0 9/97

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (Name and project phase)
CRAS of the FPL Cape Canaveral Energy Center Project

Report Title (exactly as on title page)
Cultural Resource Assessment Survey of the Florida Power & Light Company (FPL) Cape Canaveral Energy Center Project: Brevard County

Report Author(s) (as on title page— individual or corporate; last names first)
Janus Research

Publication Date (year) 2009 **T**otal Number of Pages in Report (Count text, figures, tables, not site forms) 91

Publication Information (If relevant, series and no. in series, publisher, and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*: see *Guide to the Survey Log Sheet*.)
Janus Research, 1300 N. Westshore Blvd, Suite 100, Tampa FL 33607

Supervisor(s) of Fieldwork (whether or not the same as author[s]; last name first) Hoffman, Kathleen S., Ph.D.

Affiliation of Fieldworkers (organization, city) Janus Research, Tampa

Key Words/Phrases (Don't use the county, or common words like *archaeology*, *structure*, *survey*, *architecture*. Put the most important first. Limit each word or phrase to 25 characters.)
Cape Canaveral Energy Complex, Power Plant, Indian River

Survey Sponsors (corporation, government unit, or person who is directly paying for fieldwork)
Name Florida Power & Light
Address/Phone -

Recorder of *Log Sheet* Janus Research Date *Log Sheet* Completed 3/6/09

Is this survey or project a continuation of a previous project? ❑ No ☑ Yes: Previous survey #(s) [FMSF only]

Mapping

Counties (List each one in which field survey was done - do not abbreviate; use supplement sheet if necessary)
Brevard

USGS 1:24,000 Map(s) : Map Name/Date of Latest Revision (use supplement sheet if necessary):
Sharpes / 1980

Description of Survey Area

Dates for Fieldwork: Start 9/3/08 End 3/3/09 **T**otal Area Surveyed (fill in one) - hectares 75 acres
Number of Distinct Tracts or Areas Surveyed 3
If Corridor (fill in one for each): **W**idth - meters - feet **L**ength - kilometers - miles

Survey Log Sheet of the Florida Master Site File

Research and Field Methods

Types of Survey (check all that apply): ☑ archaeological ☑ architectural ❑ historical/archival ❑ underwater ❑ other:_____

Preliminary Methods (✔Check as many as apply to the project as a whole. If needed write others at bottom).

❑ Florida Archives (Gray Building)	❑ library research- *local public*	☑ local property or tax records	☑ windshield
❑ Florida Photo Archives (Gray Building)	❑ library-special collection - *nonlocal*	❑ newspaper files	☑ aerial photography
☑ FMSF site property search	☑ Public Lands Survey (maps at DEP)	☑ literature search	
☑ FMSF survey search	☑ local informant(s)	❑ Sanborn Insurance maps	

☑ other (describe) Janus Library

Archaeological Methods (Describe the proportion of properties at which method was used by **writing in** the corresponding letter. Blanks are interpreted as "None.")

F(-ew: 0-20%), **S**(-ome: 20-50%); **M**(-ost: 50-90%); or **A**(-ll, Nearly all: 90-100%). If needed write others at bottom.

❑ Check here if **NO** archaeological methods were used.

___ surface collection, controlled	___ other screen shovel test (size: ____)	___ block excavation (at least 2x2 M)
___ surface collection, **un**controlled	___ water screen (finest size: ____)	___ soil resistivity
S shovel test-1/4"screen	___ posthole tests	___ magnetometer
___ shovel test-1/8" screen	___ auger (size:____)	___ side scan sonar
___ shovel test 1/16"screen	___ coring	___ unknown
___ shovel test-unscreened	___ test excavation (at least 1x2 M)	

A other (describe): Pedestrian survey; Inspection of burrow aprons and spoil piles

Historical/Architectural Methods (Describe the proportion of properties at which method was used by **writing in** the corresponding letter. Blanks are interpreted as "None.")

F(-ew: 0-20%), **S**(-ome: 20-50%); **M**(-ost: 50-90%); or **A**(-ll, Nearly all: 90-100%). If needed write others at bottom.

❑ Check here if **NO** historical/architectural methods were used.

___ building permits	___ demolition permits	___ neighbor interview	___ subdivision maps
___ commercial permits	___ exposed ground inspected	___ occupant interview	___ tax records
___ interior documentation	___ local property records	___ occupation permits	___ unknown

A other (describe): Visually inspected all potentially historic resourcs within the project Area of Potential Effect; Historic aerials

Scope/Intensity/Procedures

27 Shovel Tests (50 cm in diameter) dug to a minimum of 1m, screened through 1/4 inch hardware cloth, no cultural materials identified.

Pedestrian survey of project area. Historic resource reconnaissance survey for an area of one-half mile radius from the CCEC Site.

Survey Results (cultural resources recorded)

Site Significance Evaluated? ❑Yes ☑No If *Yes*, circle NR-eligible/significant site numbers below.

Site Counts: Previously Recorded Sites 0 Newly Recorded Sites 0

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8." Attach supplementary pages if necessary)

N/A

Newly Recorded Site #'s (Are you sure all are originals and not updates? Identify methods used to check for updates, ie, researched the FMSF records. List site #'s without "8." Attach supplementary pages if necessary.)

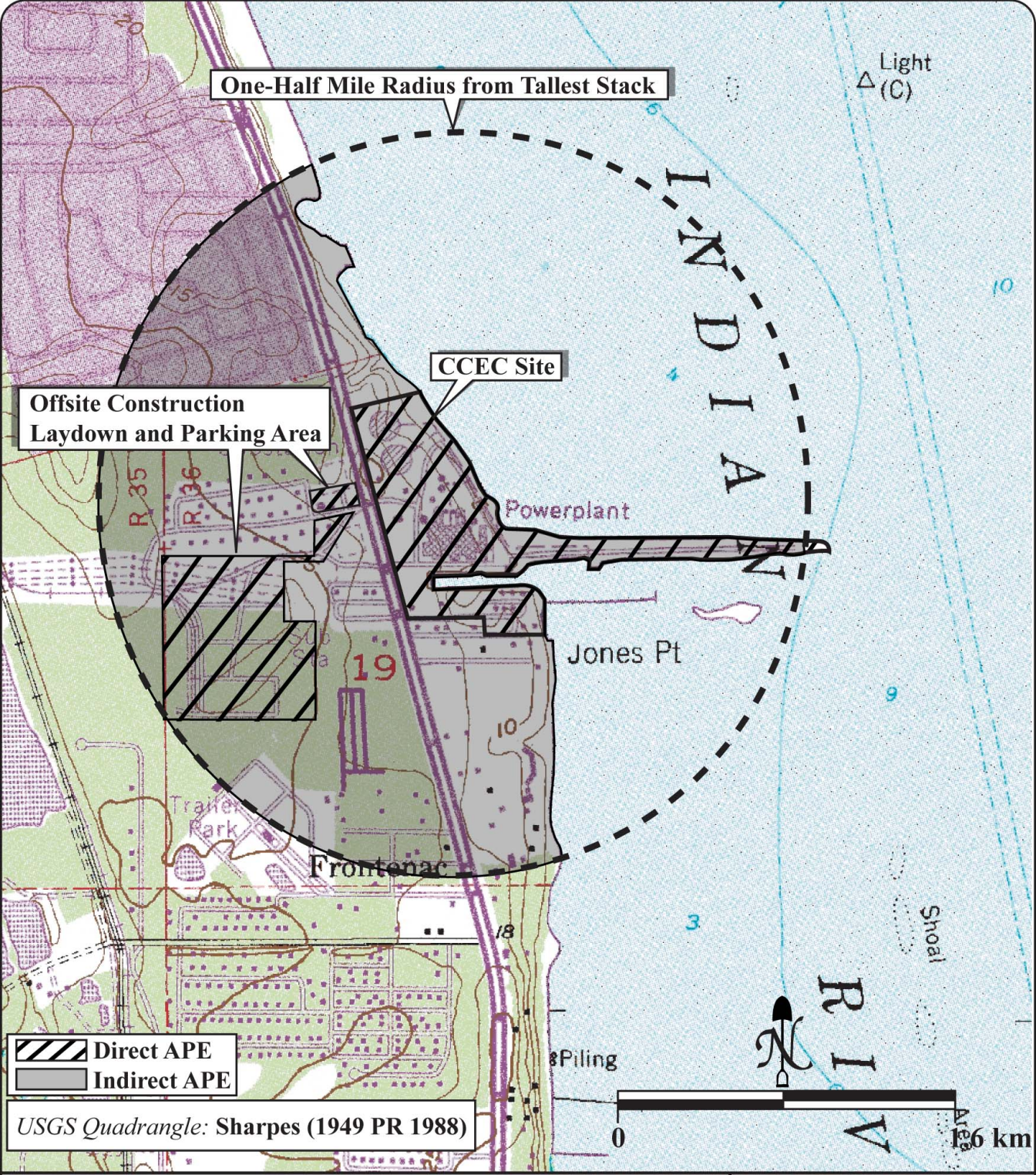
N/A

Site Form Used: ❑ SmartForm ☑ FMSF Paper Form ❑ Approved Custom Form: Attach copies of written approval from FMSF Supervisor.

DO NOT USE SITE FILE USE ONLY DO NOT USE

BAR Related		BHP Related
❑ 872	❑ 1A32	❑ State Historic Preservation Grant
❑ CARL	❑ UW	❑ Compliance Review: CRAT #_____

ATTACH PLOT OF SURVEY AREA ON PHOTOCOPIES OF USGS 1:24,000 MAP(S)



Area of Potential Effect Illustrated on USGS Quadrangle

JANUS RESEARCH